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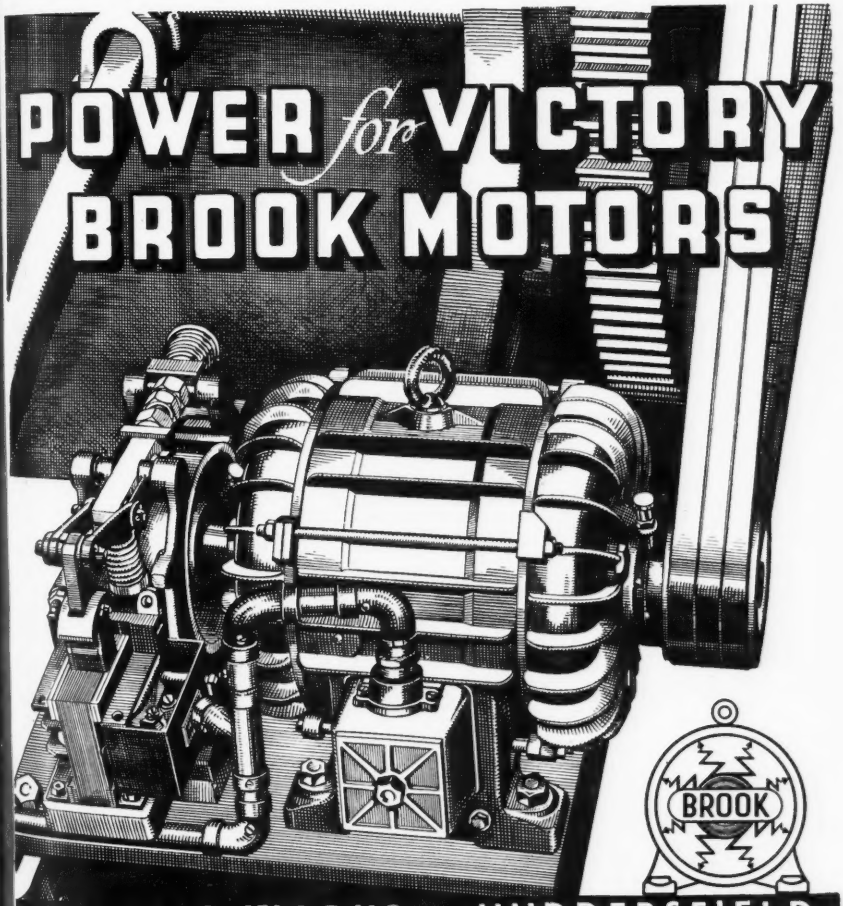

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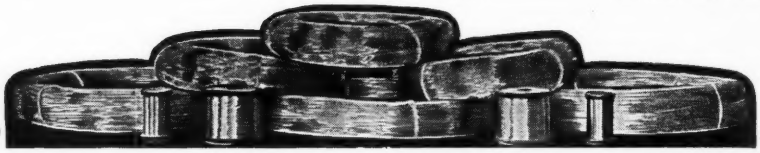

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# ELECTRICAL REVIEW

October 29, 1943

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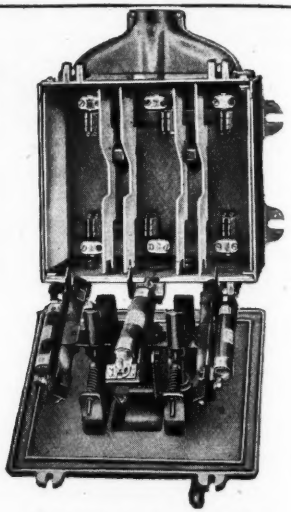

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# ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

Vol. CXXXIII. No. 3440. OCTOBER 29, 1943 6d. WEEKLY


# Works Engineers

## *Qualifications and Proper Recognition*

RECOGNITION of what electricity has done towards winning the war is now general. New factories have been erected and have been electrified as a matter of course. Old works have been enlarged and their installations extended and modernised. The results are evident everywhere, but it is not to be assumed that the success that has attended them has come about without unceasing effort on the part of the engineers responsible.

### Key Positions

Credit should be given to those who, by designing clean and efficient layouts, by apt improvisation with available material and by preventing or shortening the periods of breakdown (often with fewer and less experienced assistants) have contributed so largely to keeping productive plant running under the most onerous conditions. Nevertheless, it is to be doubted whether the "key" nature of the position occupied by electrical engineers in factories is as widely appreciated as it should be. More than a hint of this is given in the references to the untoward results of cutting down maintenance staffs which were made by Sir Wilfred Garrett and Mr. H. W. Swann in their annual reports (see the *Electrical Review* of October 15th).

Responsibility for failure to assess at their true value the necessary qualifications and appropriate status of technical men cannot with fairness be laid entirely on the shoulders of non-electrical employers. It is clearly beyond the powers of the latter, without help from engineers themselves, to make even a roughly approximate estimate of the worth of services that may be "unproductive" but are yet essential to efficient production.

An effectual aid to clarifying the position is likely to be found in the diploma scheme for electrical maintenance and installation engineers which Mr. Swann outlined last week in his presidential address to the Association of Supervising Electrical Engineers. It is to be hoped that these proposals will meet generally with the sympathetic response already indicated in some authoritative quarters. The scheme provides for an examination of an unusual kind that appears to be admirably suited to the inherently practical character of the type of man required for the duties.

### Ability to Explain

After ascertaining by means of written work that the candidate has reasonable academic qualifications, an oral test is made of his ability to organise the work of others and to make clear to them how his ideas are to be carried out, to arrange contracts and generally to fit himself to be regarded as an administrator of an important department. In order to further the last aim, we would suggest that a candidate should be required to explain a scheme involving money expenditure in such a way that it could be readily understood and therefore likely to be favourably considered by a non-electrical works manager.

The ultimate significance of the Swann

Diploma (as the Association has appropriately decided to christen it) is much more, however, than in its relation to legitimate professional interests. With the great increase in the scope of the duties of installation and maintenance engineers that is to be expected after the war, it will be of ever-growing importance to industry as a whole that the real authority accorded them shall be on a par with their true responsibilities and that their status shall attract men of the right type.

**A.S.E.E. Salaries Schedule**

THE salaries schedule produced by the Association of Supervising Electrical Engineers for its members on the "installation and utilisation" side of the electricity supply industry is no doubt a laudable attempt to give some general guidance to those concerned, but it will be difficult to apply in very many individual cases. It distinguishes between London and other areas but makes no allowance for differences in the size of undertakings and therefore in the amount of work and responsibility involved. In this respect it differs from the E.P.E.A. schedule with which it is likely to overlap in some respects. Moreover, it will not have the cachet of a National Joint Board which the E.P.E.A. schedule enjoys. What is really wanted is an extension of the latter schedule (where it needs extension) to cover the men for whom the A.S.E.E. scale is intended, but this, we realise, raises some very nice problems.

**Designed Material**

IF a country's natural resources are limited, it becomes all the more necessary to consider the provision of artificial substitutes as and when research makes these available. Recent advances in the development of synthetics hold out great promise in this direction, as Mr. T. R. Scott showed in his inaugural address to the I.E.E. Transmission Section. These include all the possibilities arising out of the interpretation of dielectric phenomena in terms of atomic structure. Instead of accepting what nature happens to provide that is more or less suitable for the purpose, the ability to design material, on a basis of molecular rearrangement, to have definite foreseeable characteristics, *e.g.*, mechanical and electric strengths and resistance to heat and acids, opens up an illimitable vista.

**Scotland's Share**

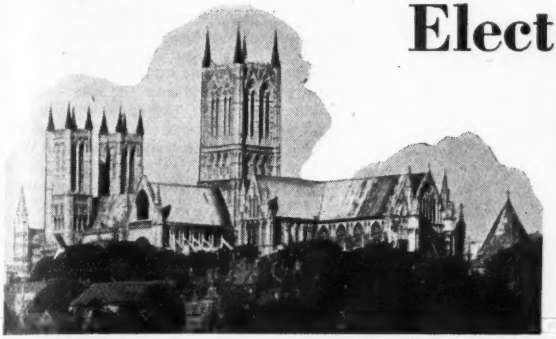
SCOTTISH engineers and scientists have made very substantial contributions to industrial progress and it was therefore natural for Mr. D. W. Low, in his address to the Scottish Centre of the I.E.E., to suggest that their home country should have benefited more from their work than has been the case. Nevertheless, for its population, Scotland has really done well electrically; there are many important concerns, not perhaps of the first magnitude, but with world-wide reputations, which have their domicile in Scotland. We feel that Mr. Low may not have done full justice to them, but that was no doubt due to his anxiety that more and greater electrical work should be carried out in Scotland. In any surveys bearing upon the location or redistribution of industry due weight should be given to his proposals.

**Inventors**

INABILITY to get their ideas taken up is sometimes ascribed by inventors to undue conservatism on the part of manufacturers. Inventors may not always realise that improvements, apparently obvious, may not be great enough to justify the scrapping of existing plant. Again, they may feel, as Mr. E. W. Moss suggested in his chairman's address to the I.E.E. Measurements Section, that the staffs of the great industrial research departments are prejudiced against the free lance. It would indeed be a pity if any under-estimation of the value of the independent investigators were permitted to discount the incalculable debt owed to organised research.

**Industry and Research**

ALTHOUGH the electrical industry is ahead of most in the attention it pays to research, the need for it to retain and even improve its relative position will certainly not diminish in the future, since its opportunities for benefiting by research are likely to increase in snowball fashion. Two outstanding points in the F.B.I. report (see page 573), are that the most fruitful results are obtained from research carried out in industrial laboratories and that the smallest firms should keep abreast of appropriate research through staff appointed for the purpose. Such individual efforts will, nevertheless, need to be supplemented by the work of research associations.

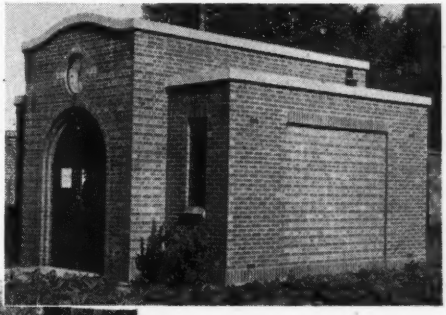


# Electricity in Lincoln

## *Lessons from a Progressive Undertaking*

LINCOLN is frequently held up by town planners as an example of the way our post-war cities should be encouraged to develop. Its area of just under 7,000 acres and its (pre-war) population of 66,000 are regarded as approaching the optimum figures, while the general layout with well-defined zones for industry, residential quarters, shopping and amusement centres, and open spaces leave room for improvement only in detail.

The way in which the city has developed has also made it possible, thanks, it is true, largely to its geographical situation, to retain unspoiled most of the historical architectural features with which the place abounds. The original Roman camp of Lindon Colonia (from which the present name is derived) was situated on top of the 200-ft. hill, now dominated by the cathedral and castle. At the foot of this hill and to the south has grown up the modern shopping centre, while farther south still, over the river Witham, is the industrial district. The residential quarters are distributed throughout the outer areas.

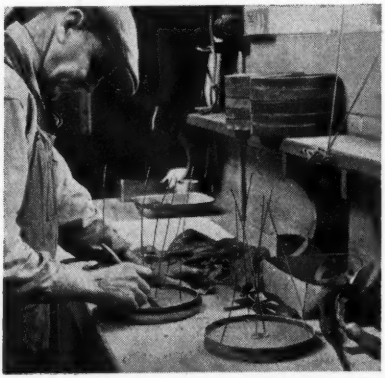


**All the substations built in recent years have been designed with special reference to their surroundings. Many of them have electric clocks above the doorways serving as an advertisement of electricity**

As in town planning, so in electricity supply does Lincoln provide many points worth emulating. A public supply was commenced in 1898 from a small generating station at Brayford Side, where now stand the offices, repair departments, etc. Thanks to a very large extent to the development of the industrial load, the growth of the undertaking has been rapid. To meet the increasing demand the St. Swithin's generating station, constructed in 1919 on the north bank of the river at Stamp End, has been extended from time to time, and is now a selected station under the Mid-East England Scheme.

Development has been especially noticeable in the past ten years or so, since, in fact, Mr. F. Newey, now in his second year of presidency of the I.M.E.A., was appointed

engineer and manager of the undertaking. Consumption of energy has been trebled while the number of consumers has been



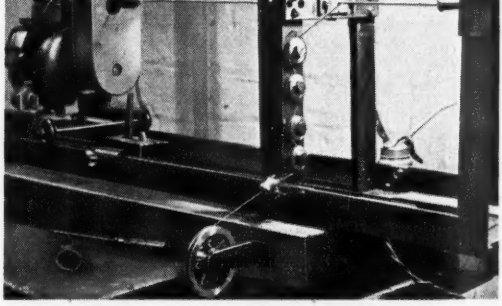
**The Department rewires cooker hotplates, etc., for its own and neighbouring undertakings**

almost quadrupled. The war has, of course, virtually stopped the connection of new consumers except in special circumstances, but in the period immediately preceding the outbreak of hostilities over 2,000 connections a year were being made—in one year as many as 2,800. The result is that well over 90 per cent. of the premises in the city are supplied with electricity. But for the war most of the buildings not on the mains would no doubt have been connected by now.

The extension of supplies to new consumers is facilitated by the high degree of coverage provided by the mains. Although there are only 77 miles of streets, there are 170 miles of mains (almost all underground); there are distributors down both sides of practically every street. The method generally adopted of sectionalising the busbars in the substations and employing busbar couplers greatly simplifies maintenance and the repair of faults. All the substations built in recent years have been designed with special attention to their surroundings, some, in particular, with their accompanying gardens being really elegant. The addition to many of them of electric clocks above the doorways adds a useful amenity as well as serving as an advertisement for electricity. The Department has also kept abreast of up-to-date practice by converting practically the whole of its system to the standard 230/400-V, 3-phase, 50-cycle AC supply, there now being only about 25 consumers, all power users, still on DC.

Methods of encouraging the use of electricity (in peacetime, of course, for the Department has participated wholeheartedly in the fuel-saving campaign) have differed from time to time according to circumstances, but the general policy has been to co-operate with any movement that would give publicity. Electricity has always been to the fore in any local exhibition, carnival or similar effort, while cooking demonstrations, etc., are still a regular feature though they have been modified to co-operate with the various food, fuel, "Dig for Victory" and War Savings campaigns. As a result, over 1,000 persons attended the twice-weekly demonstrations last year. During the same period nearly 4,000 problems on fuel economy and nearly as many on food have been answered at the advice bureau at the Corporation's showrooms, truly a valuable contribution to the war effort. Incidentally, but for the war new showrooms and offices of the most modern design would have been completed by this time on a site in the centre of the city.

Regular advertising in the local Press continues to be found well worth while.

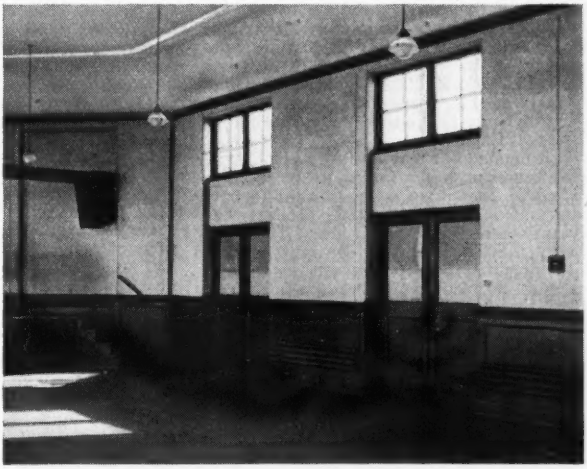


**An automatic element spiral winding machine constructed by the Department's staff**

Consumers who, despite all the above-mentioned inducements, failed to take advantage of the facilities offered, in pre-war days received a visit from canvassers.

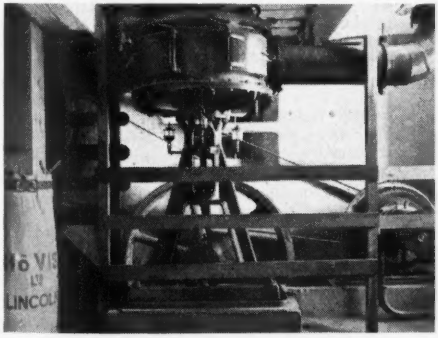
Tariffs for energy, assisted wiring and apparatus have all been carefully designed to stimulate development and no increase in charges has been found necessary during the war, the last alteration having been made in 1938 when prices were lowered. Besides the usual flat rate tariff for lighting and heating and a domestic two-part tariff (rateable

value charge plus ¼d. per kWh), there is a special domestic all-in tariff under which consumers, paying 1½d. per kWh for the first 250 kWh a quarter and ¼d. in excess of that amount, have their premises wired and a cooker or 1½-gal. water heater installed without extra charge. There are no meter rents. Power consumers get their supplies at attractive rates for general requirements, with special low charges for contract supplies. Hire facilities have been provided for cookers, water heaters, radiators, wash boilers, fans and motors. A special hire-purchase scheme for refrigerators with a payment of 1s. a week for ten years (fixed as a result of investigations as to the price housewives felt they could afford to pay) was just beginning to get into its stride when the war put a stop to it.



**The hall of one of the first schools to have tubular heating installed. Supplementary heaters are installed in the cornices**

To maintain these various appliances in working order—which is essential to the satisfactory operation of the scheme—the undertaking has established its own repair department, which under a regional mutual aid scheme also serves other supply authorities in the district. Complete overhauls are undertaken and apparatus returned to service is practically indistinguishable from new. For the rewiring of cooker hotplates, grill boilers, radiators, etc., a novel automatic element spiral winding machine has been constructed by the Department's own staff.



**Application of electric drive in one of the local flour mills**

As a result of all these facilities the average sales of electricity for lighting and domestic purposes per head of population have advanced in the past ten years from 56 to 276 kWh. One in every four of the 17,000 consumers now has an electric cooker and the same number an electric water heater (nearly all of the self-contained 1½-gal. type). The average price per kWh sold for all purposes has fallen during the past decade from 1·12d. to 0·884d.

Side by side with its progress on the domestic side in recent years there has been great development in the industrial load. Since the last century Lincoln has been famous as an engineering centre, covering such items as general engineering, excavating machinery, constructional steelwork, cutting tools, land and marine oil engines, servo brakes, mining apparatus, leather belting, pumps, boilers, etc. Other industries served include flour milling, agricultural implements, fertilisers, wagons, furniture, waterproof covers, bedding, artificial stone, basket ware, timber and joinery, glue, gelatine, patent foods and medicines, bricks and tiles, tar distilling, potato crisps and canning. All these industries and others besides are finding new applications for electricity and their demand is constantly increasing.

# Aspects of Invention

## *Justification of Patent Monopolies*

THE relationship of invention to industry and the limited monopoly which can be obtained for patented devices are commented on by Mr. E. W. Moss (Messrs Raworth, Moss and Cook, chartered patent agents) in his inaugural address to the Measurements Section of the Institution of Electrical Engineers.

It is pointed out that an improver of detail who causes a basic invention to become successful may often be considered to have contributed more to the final product than the originator of the broad idea. There is a theory that invention will be most efficient if the potential inventor who sets out to solve a certain problem has before him full details of all that has gone before. But it must be borne in mind that in those circumstances an inventor may be led away from the successful solution by knowledge of what others have proposed, rendering it difficult to appreciate why a particular line of attack failed. The inventor will often do better by following his own line of suggestion.

### Effect on Employment

It is impossible to lay down rules for the making of inventions; so much depends upon the individual, whose solution may result from the union of genius with experience, or it may be the result of laborious research. Some inventions tend for a time to cause unemployment, but the cheapening which they eventually bring about induces them to be more generally employed so that more employment is finally created. Social legislation will no doubt, says Mr. Moss, provide the means to overcome such difficulties as may be experienced in transition periods so that workers may not fear immediate handicaps temporarily imposed by the introduction of new things, the full benefit of which can only be enjoyed subsequently. Invention must tend to reduce prices and to provide goods which will improve amenities and the people's enjoyment thereof.

The contention that invention has been a retrograde step in human affairs is unsound, because the so-called misuse of invention depends on the degree of education of the human race, which is apt to forget that progress has far outstripped ethics.

The State grants a monopoly for an invention (usually termed a patent) for a limited period as a reward for the production of something new (which the public will probably not otherwise obtain) and in exchange for instructing the community how to take full advantage of it when the monopoly period ceases. It is in contra-distinction to the ancient kind of monopoly which conferred the right to manufacture, or sell, something already in existence (like salt and coal) thus depriving the public of something to which it previously had free access.

Section 6 of the Statute of Monopolies of James I (1623) can reasonably be said to have formed the basis for the laws relating to monopolies for inventions, the grant of which is obtainable in at least 136 countries.

### Financing of Research

No concern will be willing to expend large sums of money on research if its discoveries and inventions have to be placed at the disposal of the whole industry. But there is a tendency for industrial concerns which become large enough to finance research departments of their own to show no interest in inventions made outside their own organisations. Such a narrow policy is not encouraging and might be changed with advantage both to the concerns themselves and the community in general.

The strongest industrial nations have the most effective patent systems. It seems to be amply proved that industrial development is encouraged by the existence of such monopolies and, in the opinion of Mr. Moss, to do away with them would be little short of disastrous.

There is a school of thought which considers that the use of standardised articles only should be permitted. If such were the case progress would be hampered because it would be useless to invent anything other than a standardised model. Thus standardisation of the spacing between and size of fixing holes in electricity meters might, on the one hand, discourage advances in design; on the other hand the benefits to be derived therefrom might outweigh the value of possible invention. Very careful thought is therefore required before deciding to standardise any article, or part; it seems advisable also that standard specifications should be reviewed regularly for the purpose of ascertaining whether modification is desirable in respect of possible effect on progress and development.

## Help from Waste Paper

THE work of the Electrical Industry Waste Paper Recovery Committee has resulted in the collection of about 1,900 tons of waste paper. It was suggested earlier in the campaign that electrical firms and individuals disposing of waste paper might like to send the proceeds of their sales to the Electrical Industries Benevolent Association and many have done this. As a result the E.I.B.A. has benefited to the extent of £540.

# Domestic Fused Plug

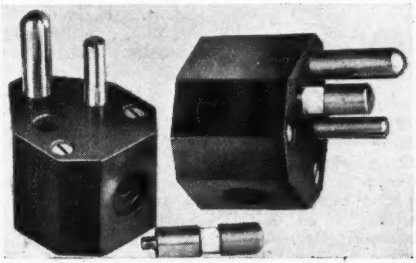
## *Proposed Standard Design*

**By Richard Amberton, M.I.E.E.**

A GOOD deal of thought has been given to the problem of the wiring of small and moderate sized post-war houses. There is a consensus of opinion that to make it easy for the consumer to employ more current-consuming devices, the number of socket outlets provided should be much greater than was customary before the war. It is also agreed that in order to keep down the cost of installation all the sockets should be on a ring main round the house or flat, to make it possible for the distribution board to contain only three fuses, respectively serving the cooker, etc., socket outlets and lighting circuits.

Inasmuch as the biggest individual load expected to be put on a ring main in the type of house in question is a 2-kW fire, a capacity of 10 A is adequate for plugs and sockets. Anything smaller is considered unsafe, and the 15-A size is unnecessarily costly. Revision of B.S.S. 546 will be necessary to carry out this policy, as no 10-A plug is provided for at present.

The fuse in the distribution board which protects the ring main cannot be of lower rating than 30 A. There would therefore be no adequate protection for any of the 10-A plug points if no other fuses were provided and, furthermore, it is not desirable for the failure of the apparatus at one plug point to result in the whole ring main being cut off. It is therefore considered to be necessary to protect each plug point with its own fuse, which can be done in three ways.



**New socket-outlet plug showing fused pin withdrawn and inserted**

Cost of installation, apart from other disadvantages, definitely rules out the first method—the provision of a small fuse box alongside each individual socket.

Under Rule 612 (A) of the eleventh edition of the I.E.E. Wiring Regulations it is not admissable to fit a fuse into a socket outlet. In my opinion the main disadvantages of this are that (*a*) the fuse has to be replaced on to a live circuit, which makes it essential to provide it with an insulated handle and, unless the cost is still further increased, live parts will be exposed when the fuse is withdrawn; (*b*) the socket has to be larger than is otherwise necessary at an extra cost of, say, 2s. or more per socket (including fuse and clips, etc.); (*c*) additional contacts are involved between fuse and clips and between clips and socket; (*d*) the socket is usually mounted on the skirting near the floor, and is relatively inaccessible for replacing fuses; (*e*) unless a fuse with a good rupturing capacity is employed, or if for any reason the fuse contacts should become damaged, the repair or replacement of the socket will be a skilled and costly operation. Any attempt by an unskilled person to replace a socket on a ring main is fraught with danger and is likely to impair the subsequent safety of the installation. In the event of a flash-over due to misuse of the fuse the whole ring main may be put out of action.

There is no technical advantage in having the fuse in the socket, and the only argument in its favour is, that a proportion of old 5-A plugs rated up to 10 A might be capable of being used if new sockets were designed for them made suitable for connection to a ring main, and provided with a 10-A fuse. This will be discussed later on.

There are no technical disadvantages in a fused pin. The fuse can only be replaced after the plug is withdrawn, so this operation is unquestionably safe. There is no increase in size, if the fuse takes the place of one of the pins of the plug. The only increase in cost is the difference in cost of a fuse instead of a pin, a matter of a very small number of pence. The inclusion of the fuse does not involve any additional contacts.

If the fuse is in the plug and the latter is wired to the apparatus it is to protect, it is evident that on the blowing of the fuse due to a fault in the apparatus the plug can be withdrawn and the apparatus removed, leaving the socket intact and ready to receive some other load. The replacement of the fuse is obviously a safe, simple and easy matter, as the plug is withdrawn and can be

taken to any light and convenient spot for the purpose. If the plug should be damaged through misuse of the fuse, the socket and the rest of the circuit will be unimpaired, and the replacement of the plug is a relatively cheap and easy operation which the average consumer can do for himself.

The only arguments raised in favour of having the fuse in the socket are that new plugs with fuses in them will not fit old installations. They are not intended to. They are meant for new post-war installations. Old plugs without fuses could not be used in new sockets on a ring main designed to take a plug of which one pin is a fuse.

It has been contended that by the simple process of "up-rating" the 5-A plug to 10 A the whole problem could be solved. It is true that certain makes of 5-A plugs and sockets are capable of carrying 10 A, but there are some makes which, in spite of having the same sized pins, are definitely not sufficient for 10 A, and have been the cause of much trouble when used for electric irons and fires. It is not only the pins which have to be taken into account, but the amount of metal and space available for a three-core 10-A flex. The introduction of a fuse into a socket or plug is bound to result in additional heating.

### Accommodating a 30-A Ring Main

Thus, it appears, existing 5-A plugs and sockets are not suitable for 10 A in post-war housing schemes because (*a*) sockets in post-war installations will have to be suitable for receiving a 30-A ring main without cutting the cable; (*b*) some—not all—existing 5-A plugs may be capable of carrying 10 A, but many are not. It is doubtful if any are really suitable for taking a 10-A three-core flex; (*c*) a 10-A fuse will have to be provided either in the socket or in the plug.

Incidentally, it is the practice of some authorities to leave new installations complete with plugs in the sockets. In such cases there is not much advantage in the incoming tenant being able to use his old plugs. In any event, the advantage to be gained is very small, as the cost of half a dozen or so new plugs is a small proportion of the cost of removal of the humblest tenant of a small house or flat and, furthermore, the number of non-standard plugs at present in use is so great that many of them would not fit the present standard 5-A three-pin socket.

It will probably be conceded that if each plug point is to be provided with a fuse, 2s. or more per point can be saved by making one of the pins of the plug into a fuse, instead of enlarging the socket to take a fuse with insulated handle. However, a further economy can be made. The present 5-A three-pin plug is larger than it need be. Experiments have established that the present 2-A plug and socket, if provided with metal parts of adequate size, is satisfactory for 10 A and will stand up to an AC insulation test of 2,000 V. The adoption of something on these lines will not only save cost, but also wall space. The ideal is probably something in between the present 2- and 5-A dimensions.

If entirely new external dimensions and centres are to be adopted, it would, of course, mean that in due course some of the existing jigs and tools used in plug and socket manufacture would have to be scrapped. Is this a matter of importance? I think not, because new jigs and tools for the sockets will have to be made in any event, to make them suitable for 30-A ring mains, so that the only question concerns new tools for the plugs. Alterations to make them suitable for 10-A three-core flex appear to be necessary in any event. Apart from this the cost of tools for plugs is so small in relation to the turnover that it merges into insignificance.

### Safe Replacement

Whether the fuse is to be in the socket, or in the plug, the consumer will replace the fuses himself as a general rule. Safety is therefore an important consideration, and any fuse employed should have a sufficient rupturing capacity to preclude a serious flash, or explosion, when the consumer plugs in on a short circuit. The designers of the plug with a fuse replacing one of the pins were at great pains to deal effectively with this essential requirement. Their pin fuse has opened the circuit without noticeable flash, or noise, at the following prospective short circuits:—

| *Testing Institution* | *Voltage* | *Prospective short-circuit current* Amps |
|---|---|---|
| Salford Corporation | 400 AC | 18,800 |
| National Physical Laboratory | 250 DC | 16,500 |
| | 500 DC | 10,000 |
| Manchester Corporation | 250 DC | 32,800 |

In each case the prospective short-circuit value was the highest available at the time the tests were made. Oscillograph records showed that the time taken to interrupt the circuit was approximately 0·0006 sec. It is not proposed that the new design should be the subject of a monopoly.

The industry is faced with two alternatives. It must put up the cost of every new installation considerably and adopt an unsound practice, in the hope of being able to use a proportion of old plugs in new installations, with the certainty that it will only be practicable to do so to a very limited extent. Otherwise it must face the issue boldly and decide on a new standard with the concomitant effort which this will entail, but with the certainty of affording the consumer a greater measure of safety and convenience at a great deal lower cost.

# Installation Practice

## *Need for Standardisation and Simplification*

REMEDIES for some of the defects and shortcomings of installation equipment and accessories are suggested by Mr. A. G. Ramsey (chief engineer, Ministry of Works) in his address as chairman of the Installations Section of the Institution of Electrical Engineers. Mr. Ramsey considers that there is a tendency for apparatus to be too complicated, and consequently dear to produce and install, as well as increasing difficulties of reasonable maintenance. Standardisation, excellent so far as it goes, is limited in nearly every case to rating, with the result that there are too many variations in common products made by different manufacturers for the same purpose. No attempt has yet been made by the industry as a whole to standardise those features which are not affected by functional design; there have been few attempts to break away completely from the old original basic designs. Very much simpler designs exclusively for AC installations are possible; apparatus for DC installations might now be regarded as special.

Manufacturers have never co-operated for standardisation of those features which permit interchangeability with, and extension by, any make of product for the same purpose. The possibility of replacing one make of switch and control gear by another would considerably benefit home trade and remove many difficulties experienced in export trade.

Makers should refuse to modify already adequate products to purchasers' individual special requirements (generally unnecessary), thereby increasing their number, raising cost and upsetting production. Difficulties must be regarded as the gateways to opportunity; capital expenditure will in any case be involved in the change back to normal production, but reduction of the number of types and more general simplification should lessen the capital expenditure necessary for manufacturing machinery and tools and also speed up production. Reasonable selling prices should therefore bring greater returns and, furthermore, cost of maintenance under guarantee should be lower owing to the fewer and cheaper spares needed.

### Distribution Services

The post-war prospect of non-standard service intake systems and voltages with otherwise successfully standardised necessities is viewed with horror. It is hoped that the earnest plea of both consumers and manufacturers for uniformity will be met with speedy action on the part of suppliers of electricity immediately after the war. Single-metered standardised supply-service capacity and layout combined with house-wiring control has already been recommended.

Unification of tariffs is vital and Mr. Ramsey further calls for the extension of the relevant Standard Specifications to include dimensional standardisation of low-voltage busbar, air breaker, contactor, switch, fuse, meter and instrument units, as well as cable-dividing boxes. Similar dimensional limitation of high-voltage unit gear is necessary and interchangeability of fuse carriers would be a great advantage.

The dimensions of distribution boards with either single-pole fuse or small breaker protection should be standardised to facilitate planning; installation engineers should be in a position to advise architects of the exact sizes of recesses required. Probably six sizes of sub-main boards and about the same number of circuit-distribution boards should suffice for nearly all installation requirements. Standardised arrangements for the reception of cable, conduit and solid-bar conductors should receive attention. All small capacity fuses used in dwelling-houses, flats and offices could be standardised in about six sizes to enable occupants to purchase them locally.

### Accessories and Wiring

No engineer can believe that purchasers created the demand for such extraordinary variety in accessories, which can only be attributed to absence of co-operation between manufacturers and lack of appreciation of the extent of the waste and inefficiency involved. No sales policy can provide an adequate answer to such unsound methods of so-called "mass production." The advocacy of one standard size socket-outlet with fused plug for domestic installations and the employment of micro-gap type switches is supported by Mr. Ramsey, who suggests that such principles of simplification and complete re-design might with advantage be applied to other accessories.

The use of plastic materials for cable insulation may overcome some shortcomings, but in this connection Mr. Ramsey says that unless there is very close co-operation between cable makers and accessory manufacturers, as well as engineers who have to install their products, there will be grave danger of unsuitability of reception and terminal arrangements in accessories for the newer classes of cables and wires.

The rationalisation of lighting fittings is being intensively studied, but that will not go far enough. What is needed is the co-

operation of architects and decorative artists for co-ordinating the decoration, placing and shape of the light sources. An era of large light sources is approaching. Fluorescent lamps require something better than the ordinary form of lampholder; the standardisation of their starting switches seems to be an urgent necessity and their peak characteristics need to be flattened out to eliminate the initial drop in output which has a serious psychological effect.

The desirability of planning kitchens and other rooms and for making certain that household apparatus (even when its purchase is deferred) will fit into spaces allotted in advance, sometimes restricted, necessitate the extension of the scope of existing and new B.S.S. to include dimensional standardisation of fixings in some cases in addition to ratings and loadings. This embraces cooking ranges and boiling plates in common use, heating elements for both of the former, thermostatically-controlled thermal-storage water heaters over the whole range rom 1·5 to 100 gallons capacity, refrigerators, wash-boilers and clothes washers, rod elements for fires, and elements for such appliances as irons, kettles, toasters, etc., to promote better service by making local purchase possible.

The number of small motors required for domestic appliances is so great as to make dimensional standardisation and interchangeability almost necessities. Many other cases of simplification without affecting functional design will suggest themselves, including the possibility of dealing similarly with utility services (lift wells) in buildings.

Engineers have been forced to study realities; orthodox engineering is yielding to a more original outlook, and in some cases there has been a complete breakaway from conventional design because of the necessity for utilising substitute materials. The whole underlying policy is the best use of manpower and utmost speed in production; it is sound and has been successful. Is there a better policy as the basis of procedure for post-war efforts? The keynote is engineering common sense.

The many I.E.E. planning committees and panels are very active in a wide field. The work of the Electrical Installations Study Committee of the Ministry of Works' Directorate of Post-War Buildings is nearing completion; it has dealt specifically with all phases of the electrical equipment of (in order of priority) dwelling-houses and flats, schools, business blocks and farm buildings.

The codes of good practice that are being formulated do not necessarily represent permissible minima. Complementary to those guides it seems desirable to frame basic safety regulations to govern the minimum requirements for safety in every class of electrical installation in all categories of buildings.

### Export Trade

Shortages of materials, shipping and foreign exchange will persist and probably coincide with a peak demand in post-war buying; so it is evident that some forms of control, coupled with reconstruction priorities, will have to be continued.

It is probable that world conditions may so change as to necessitate a complete revision of the nature of equipment and goods to be exported. As the electrical industry will have to adjust itself to changed circumstances, immediate investigation to facilitate quick action is necessary.

# PARLIAMENTARY NEWS

## Italian Power Plants

IN the House of Commons last week Mr. Dalton, President of the Board of Trade, told Sir Archibald Southby that according to returns made to the Board of Trade for inclusion in the register of British property in enemy territory, United Kingdom capital invested in hydro-electric plants in Italy amounted to £800,000. Registration was not compulsory and returns might therefore not be complete. He regretted he had no information as to the extent of Allied interests.

Sir Archibald asked if Mr. Dalton would make inquiries into the ownership and capital invested in a certain hydro-electric plant which had not yet been bombed.

## Radio Set Supplies

Last week Sir Leonard Lyle asked the President of the Board of Trade how many of the 90,000 domestic wireless sets which were in process of manufacture last mid-summer had been completed and placed on the market; how many similar sets had been received in the last six months from the United States; how they had been distributed; whether sets of simple standard design were now being manufactured in Great Britain; and when these would be available to the public.

Mr. Dalton said that between June 1st and September 30th about 14,000 of the sets in process of manufacture earlier this year had been completed and marketed. This was disappointing, and he had taken steps to urge manufacturers to expedite the agreed civilian programme during the remainder of the year. About 8,000 sets had recently been imported from the United States and would shortly be released through normal trade channels. He had stated on June 8th that discussions were proceeding with the trade on the manufacture of sets of a simple standard design, but that no sets of this type could be available until next year. A design had now been agreed upon, and deliveries of raw materials and components had been planned.

# Industrial Research

## *F.B.I. Recommendations*

A REPORT on Industry and Research, which was prepared by a Committee of the Federation of British Industries, has been adopted by the Grand Council. Sir William Larke was chairman of the Committee, which included Dr. P. Dunsheath, Dr. C. C. Paterson and Sir Felix Pole as representative of electrical aspects. The Committee expresses satisfaction on the whole with the present organisation of industrial research and development but not with the scale on which research is prosecuted or with the degree to which existing machinery is utilised.

Six recommendations are made. The first is that every manufacturing firm should satisfy itself that the funds it devotes to research and development are commensurate with the nature of its problems. If the amount now spent in this connection were increased to only 1 per cent. of the total value of industrial production the resulting greater productive efficiency and employment capacity would yield an annual return of many times such expenditure. Where maintenance of its own research department is not feasible, a firm should, at least, retain one or more qualified individuals who would keep constantly under review the application of research to its activities and initiate investigations out of a special fund of a magnitude compatible with the firm's resources.

Research associations for dealing with questions of interest to a whole industry should in every way be fostered, but they ought not to be regarded as substitutes for research by individual firms, which is the most profitable kind.

### Adequate Funds Essential

The second recommendation calls upon firms to consider now whether they are making to their research association a contribution commensurate with its possibilities in furthering the interests of the industry as a whole. The next recommendation is that every industry without a collective research association should set up a committee and create and maintain a research fund which would equitably distribute the burden over the constituent concerns. The committee would determine whether the needs could best be met by a research association or by forming a link with existing associations or through university laboratories and other research establishments.

Fourthly, the Department of Scientific and Industrial Research should make the maximum use of its wide powers, both as regards the amount of grant made available in each case in relation to the countervailing contributions and as regards the eligibility for grant of other organisations (though not termed "research" associations) that fulfil similar purposes. The Department should be enabled to increase and continue indefinitely financial support from public funds to research associations as a permanent feature of the national economy, but the main responsibility for programmes and policy should continue to rest with the industries concerned.

The fifth recommendation is that the Government should allocate to the Department an annual sum of at least one million pounds for the maintenance and expansion of its activities. There should be the closest association between the staff of an association and the technical management of its members in order that results may be set out in a readily assimilable form.

### Educational Facilities

Industry must more generally provide funds for fellowships, bursaries and the like at universities and technical colleges and schools. A firm should take its research staff more fully into its confidence and give it a definite standing in its hierarchy. Co-ordinated team work is essential to efficiency, the personality of the leader being of first importance. A research worker having the requisite qualifications should be available for transfer to other branches of a firm's activities.

All expenditure on research and development should, for taxation purposes, be chargeable against revenue either immediately or over the commercial life of any asset. The problems of an individual firm too small to maintain its own research department can usually be dealt with by an existing association. No new machinery is at present necessary, though facilities similar to those provided by the Mellon and other Institutes in the United States may be needed later. There is, however, absence of adequate means whereby inventions or the fruits of fundamental research can be developed up to an industrial scale.

The Committee's final recommendation calls for the establishment immediately of a national Bureau of Industrial Research which, though financially supported by those principally concerned, should be entirely objective in its activities. This Bureau would engage in educational publicity on research; it might also advise firms whether their problems required scientific investigation and, possibly, create a liaison between research workers in similar or related fields.

# Post-War Housing

## *E.D.A. Conference at Liverpool*

THERE was an attendance of more than 300, including engineers and chairmen of many electricity supply undertakings, chairmen and officials of Housing Committees, architects, E.A.W. members, etc., at a conference held under the auspices of the North-West England and North Wales Area Committee of E.D.A. in Picton Hall, Liverpool, on October 19th. Mr. L. H. Keay, O.B.E., M.Arch. (Liverpool), F.R.I.B.A., city architect and director of housing, Liverpool, was the guest speaker.

Mr. J. E. Shepherd, M.I.E.E., who presided, remarked that so much was said about post-war reorganisation, on which several reports had been issued, that electrical engineers wondered where they stood. If there was one subject in which they were vitally interested it was that of housing. He thought that if the back of the house, the kitchen part, was made a sound engineering job, the rest of the house could almost look after itself. Whatever was done in the future, he hoped full advantage would be taken of the public utilities, especially electricity.

Mr. L. H. Keay in the course of his paper observed that there was a certain restlessness at the failure of the Government to reach decisions on the Barlow, Uthwatt and Scott reports, but one had only to look at the current issues of the technical Press to see that work was in progress on the preparation of reconstruction proposals.

The Minister of Health had stated that 4,000,000 houses would be required in the next ten years, involving an expenditure of at least £2,000,000,000. Housing should not receive exclusive priority over other essential works; certain other work was imperative if community planning and building was to be complete.

### New Townships

The contemplated new townships must be as self-contained as their size permitted; it might be desirable to work on a unit basis of 5,000 to 10,000 population, one unit constituting a self-contained village and four or five a complete town which, when fully developed, would become self-supporting.

Those who were responsible for traffic routes should make provision for trams to enjoy all the advantages of light railways running on special tracks, which in some instances might have to be sunk below the level of the normal roads. Perhaps there was the possibility of a compromise between the London Underground Railway system and street trams in order to relieve congestion in streets where there were car tracks.

In houses there was need for a better arrangement to secure higher heat and sound insulation, improved plumbing, kitchen arrangement and equipment. Extra cost could be offset by a measure of standardisation which need not hamper originality of skill in design. At least one coal fire was likely to find a place in the post-war house. Wherever electricity was available—and it should be made available to every home as soon as possible—it would be used for lighting. This would be essential in view of the probable lowering of the height of rooms to 7 ft. 6 in. and in order to reduce the cost of maintenance of decorations.

The supply industry should, as soon as possible, take what steps were necessary to introduce a universal all-in tariff, based probably on the rateable value of the dwelling supplied. Minor improvements in the pre-war types of equipment for space heating, cooking and water heating ought to be possible, giving greater convenience and lower working costs.

### Kitchen Design

The kitchen being the workshop of the house, one would expect to find there a machine which would perform all the functions of, and associated with, cooking. He hoped they would soon see the numerous isolated fittings replaced by one "machine," preferably accessible from all sides, covered on top with stainless steel with flush enamelled sides. This machine should include ovens and grillers, refrigerating drawers and cupboards, dish washers, dryers and warmers, sink and a series of plugs for the use of kettles and saucepans. A small glass-covered "jack" might also be included as a plug-in fitting. Power points would be necessary for wireless, shoe cleaning machines, etc. In flats, more lifts would be installed where they could be guaranteed to be foolproof and damage-proof.

Perhaps the larger surfaces of plain walling would induce enterprising lighting engineers to withdraw their lamp standards from the overcrowded footways and illuminate the streets from the buildings, the architect co-operating in the design of fittings.

Mr. C. D. Taite (Lancashire Electric Power Co.) proposed and Mr. H. C. Lamb (Manchester Corporation Electricity Department) seconded a vote of thanks to Mr. P. J. Robinson for the part he had taken in the organisation of the conference. Reference was made to his impending retirement and tributes were paid to the fine service he had rendered to the electrical industry.

# Scottish Industry

## *Future Direction and Prospects*

POST-WAR prospects, particularly with respect to the manufacturing side of the electrical industry in Scotland, are reflected upon by Mr. D. W. Low (director, Archibald Low Electrics, Ltd.) in his inaugural address as chairman of the Scottish Centre of the Institution of Electrical Engineers.

He commences with historical references to eminent teaching scientists and pioneer engineers born in Scotland or of long residence there, in order to indicate that it has not been for want of scientific guidance, nor for lack of facilities in technical training, that electrical engineering has not become one of the principal industries of Scotland. The extent of development in that field has been disappointing; neglect of the electrical branch has possibly been due to the fact that heavy mechanical engineering, mining and shipbuilding has been fully occupying attention and absorbing profitably all the capital being offered.

Many people do not want to return to pre-war trading conditions. It seems inevitable that industry in general will not have the freedom to which it has been accustomed; for if inflation and economic crises are to be avoided, there must be some form of control to ensure smooth transition from war to peace. Thus the primary reconstruction problem will probably be not so much one of creating new industries as of ensuring that too many firms do not engage in the manufacture of products for which the market is limited.

### Information and Guidance

To avoid such a thing happening and to guide all new developments the Scottish Economic Committee, or a Board of Control, should have information about the electrical products made in Scotland, the outputs of the various firms concerned and what markets are available to them. It should be in a position to advise new firms about the prospects of entering the electrical field of industry and recommend where new factories should be situated, making every endeavour to spread industry throughout the country rather than increase its concentration in cities and around present industrial areas. There must be co-operation with the senior partner across the border, otherwise there will be the danger of Scotland making a poor show by trying to stand by herself in industrial developments.

Scottish manufacturers should be members of all British trade associations, research boards and other industrial institutions in order to co-ordinate post-war national effort. They cannot exist on the Scottish market only and cannot expect to obtain all the Scottish business. Before the war 62·5 per cent. of Scottish output was sold to England, 10 per cent. overseas and 27·5 per cent. to Scotland.

Mr. Low considers that it is hopeless to expect Scottish manufacturers to compete with large English concerns in the making of heavy plant like turbo-generators and high-voltage switchgear; nor does he think it desirable that they should attempt to do so. He considers the better policy to be specialisation in a wide range of lighter machinery. But if they are to do this and also retain some of these industries started during the war, then it will be necessary to have the wholehearted support of the trade unions so that similar industries may operate under the same conditions in Scotland as in England.

### Marine Electrical Equipment

There will be a ready market in Scotland for marine electrical equipment, which has been neglected by Scottish firms in the past. The making of motors, low-voltage switchgear, cables, lamps and accessories should be extended and their manufacturers should not be handicapped by quotas and similar arrangements, if found to be necessary, to the detriment of Scottish industry. Post-war housing will create a large market for small refrigerators, cookers, space heaters and water heaters, in spite of the views expressed by some prominent I.E.E. members.

But neglect of overseas markets by concentration at home would be a great mistake. It is advisable that every manufacturer should lay himself out to do some export trade. Those who are not large enough to have their own local representatives should link up with others whose products are complementary for the establishment of combined representation abroad.

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## Aircraft Fitted with Searchlight

IT was made known last week that for more than a year certain R.A.F. Coastal Command aircraft have been equipped with a powerful searchlight to enable them to make night attacks on U-boats.

The searchlight is installed in the aircraft so that it does not blind the crew and throws a powerful beam on to the water. The light was perfected after much patient research. It has been named the Leigh light, after Wing Commander H. de V. Leigh, O.B.E., D.F.C., who carried out satisfactory initial tests.

# Supervising Engineers

## *Mr. H. W. Swann's Presidential Address*

PROGRESSIVELY increasing difficulties of maintaining wartime factory installations in running order and good condition are acknowledged by Mr. H. W. Swann (Chief Electrical Inspector of Factories) in his address to the Association of Supervising Electrical Engineers as president for the fifth consecutive year. Restricted supplies of materials and spare parts have thrown heavy responsibilities on supervising engineers and at the same time have taxed their resources of ingenious improvisation.

Mr. Swann has been particularly interested in the electrical activities of women in industry. He has had a natural fear that their employment in all kinds of work previously done only by men might lead to a substantial increase of electrical accidents, but nothing of that kind has happened so far as women are concerned. In 1942 there were 51 electrical fatalities in factories; only one of the victims was a woman, which is a credit to their sex as well as to the measures taken to secure their safety. There is something in the latter aspect of the matter, because in the same year there were 61 electrical fatalities (some women) on domestic and similar premises.

The major part of the address is devoted to an outline of a scheme tentatively suggested by Mr. Swann in his two previous addresses for the award by the Association of a diploma in the hope that it will assist non-technical employers to assess the value of practically trained engineers, thereby enabling supervising electrical engineers to secure further recognition. The diploma, to be endorsed with special qualifications, is to be awarded after examination (more oral than written) intended to reveal the practical competence and technical merit rather than academic achievements of candidates, together with their ability to demonstrate to others the best methods of dealing with problems relevant to their occupation.

The scheme is intended to maintain and raise the standard of competence to which electrical installation and maintenance engineers of the supervising grade shall conform. Consultations have taken place with Government Departments and reception of the scheme in principle has been favourable.

# Installation Engineers' Salaries

## *New A.S.E.E. Schedule*

THE Association of Supervising Electrical Engineers states that, in response to requests from members of the Association employed in the installation and utilisation side of the electricity supply industry, conferences were held last year to consider the compilation of a schedule of minimum salaries and designations on similar lines to the schedules for electrical contracting and general maintenance already drawn up by the A.S.E.E.

The indefinite nature of the designations employed for these men in the electricity supply industry made the matter of classification rather difficult but eventually it was found possible to form six grades covering thirteen designations. For these grades minimum basic salaries have been specified as a guide to both employers and employees. These salaries are exclusive of war bonuses which are variable. For each grade there is a starting salary and allowance for annual increments up to a stated figure and the London District (up to and including 20 miles from Charing Cross) and other districts are rated separately.

Grade 1 includes chief meter mechanicians, meter foremen and mains foremen; the salaries for these are put at £260 rising to £300 for London and £230-£260 for other districts.

Grade 2 covers installation foremen, installation inspectors and chief meter testers: London £260-£312; other districts £230-£270.

In Grade 3 are domestic and/or commercial repairs superintendents, assistant consumers' engineers and public lighting officers: London £310-360; other districts £275-£310.

Grade 4 is confined to chief installation inspectors: London £325-£400, other districts £280-£350.

Grade 5 comprises meter superintendents and installation engineers: London £350-£550; other districts £300-£475.

Grade 6 embraces consumers' and sales engineers: London £450-£750; other districts £375-£650.

Periods of notice for the termination of employment are suggested for Grades 1 to 3 and it is proposed that after six months' service a holiday of seven days shall be given, rising to 14 days after twelve months, with an additional day for each two years of further service up to a maximum of 21 days.

## "Lafayette" Salvage Nearly Completed

SPEAKING at Philadelphia last week Mr. A. C. W. Siecke, consulting engineer for the salvage firm employed by the United States Navy to assist in raising the *Lafayette*, formerly the French liner *Normandie*, said that the work was almost completed; it would be finished well within the 17 months' time-limit set by the Navy.

# Cable-Making Technique

## *Influence of Wartime Developments*

PROBABLE post-war developments induced by wartime necessities are surveyed in his address by Mr. T. R. Scott (Standard Telephones & Cables, Ltd.), chairman of the Transmission Section of the Institution of Electrical Engineers.

Mr. Scott briefly remarks upon the economic aspect of power transmission, which will become a prominent subject, merely referring to the demand for cheaper electricity and to "expediency engineering" in respect of equipment installed; the effect of the latter having shown itself during the war when the fruits of lack of foresight are reaped amidst arduous conditions. Midway between the economic and purely technical aspects is standardisation. Already the number of types and sizes of paper-insulated cables that are lead covered has been reduced. A similar plea in respect of all kinds of cables and wires may arise after the war in view of the probable growth of a large number of alternatives.

Technique, particularly in the making of wires and cables, is liable to change rapidly after the war so that standardisation will have to be set about with the greatest care to avoid distortion of economics, which will cause chaos. One lesson that is being learned from wartime specifications is the necessity for the user to be able to compile a "performance specification" which lays down as precisely as possible the desired characteristics of the cable, etc., irrespective of the materials to be used in its manufacture.

With regard to the rating of transmission systems, the increased loadings resulting from emergency redistribution of industry, coupled with the considerable effects of unexpected and irregular short-circuits, are practical demonstrations to aid investigation of standardised ratings to be agreed upon for future use.

### Electronics

Three trends that may react considerably on the power transmission field are the enclosure in cables of gas at high pressure, or a vacuum, and the use of synthetic materials. Helium ranks as a strong competitor of nitrogen and has already been successfully applied in the fire-proofing of switchgear in cases in which rapid dispersal of heat and freedom from corrosion of contacts are of importance. Intensive examination of natural-gas potentialities in America suggest that a relatively plentiful supply of helium at a price that is not based on a "scarcity" foundation may be looked forward to.

Wartime advances in electronics are likely to have four main effects on power transmission work. First, there will be some definite reaction on communication systems associated with power networks; secondly, in protective systems certain relay problems may be solved, or alleviated, by the employment of thermionic devices; thirdly, the utilisation of vacuum-tube technique for the transmission of power at high voltage may become possible.

The fourth effect is more speculative. The patent associated with cables filled with gas at high pressure was published almost simultaneously with another from the same source concerned with an equivalent cable working at extremely low pressure. A hard vacuum is a good insulator and may produce results equivalent to, if not better than, gas at high pressure. Practical difficulties have been the making of vacuum-tight equipment and exhausting it in the factory and/or in the field. But ways and means have been advanced tremendously by the mass production of vacuum tubes on the wartime scale, so that the industrial production of reasonably hard vacua is within reach.

### Synthetics

The broad term "synthetics" is definitely stressed in opposition to the narrower terms "plastics" and "artificial rubber." It is inconceivable that new industries of the magnitude built up in the United States, Canada and Britain will disappear with the regaining of the major sources of natural rubber after the war. Indeed there are signs of over-enthusiastic welcome to the newer substances. In Mr. Scott's opinion the engineer will benefit greatly from this large-scale addition to his range of materials, but only if he applies them judiciously after detailed studies.

There is a tendency to over-rate the dielectric (insulation) aspect of these materials and to under-rate the influence they will have on structures, preservatives and other more routine and unexciting parts of the engineering field. Mr. Scott looks on the matter, not merely in terms of substituting artificial for natural rubber, but as a marked step forward in the scientific control of materials and in the economic planning of resources.

He believes that at least the threshold of one more elementary, but nevertheless very practical, stage in the design of materials on the basis of molecular arrangement has been reached. It is becoming possible to "design" materials in the laboratory with

fair assurance that the resulting product will possess certain foreseen characteristics. This science of materials design has been laboriously developed over a period of years; the war has brought into prominence the production in quantity of the basic materials on which the chemist can work.

The cracking of petroleum, starting with four gases, has yielded synthetics (some 50 of which have already been applied industrially) which include nine insulating substances. In the face of our negligible oil resources attention has been turned to alternative methods of preparation from this country's own natural resources. For example, ethylene gas is a coke-oven by-product, while another excellent starting point is acetylene gas for the making of which coke, or anthracite, limestone and cheap and abundant electric power are essential. The cost of synthetics can be largely determined by the cost of electricity; the solution of this economic problem will benefit all users of electricity and, in addition, the coal industry with potential reactions on the thermal generation of electricity.

Another source of synthetics is vegetable alcohol, providing an industrial outlet for products of the agricultural industry. Such a change in agricultural outlook would react on the rural transmission of power and the distribution of electricity.

Thus utilisation of synthetics will entail serious study of economics and standardisation on the part of power transmission engineers. They must realise the interconnection between their own work and that of physicists and chemists, coupled with possible reaction on the prosperity of the coal and agricultural industries.

# Design of Equipment

## *Some Possible Improvements*

SPEAKING from the manufacturers' point of view, Mr. H. Coope (district manager, Metropolitan-Vickers Electrical Co., Ltd.) refers in his inaugural address as chairman of the Western Centre of the Institution of Electrical Engineers to what may be termed the trial and error methods which obtained in the early days of plant installation and operation. He wonders whether research will eventually lead to some alternative way of controlling AC circuits other than by pushing contacts together and pulling them apart. Post-war requirements will emphasise the necessity for further concentration on research into and the design of heavy switchgear. Electric-arc furnaces need large transformers with switchgear sometimes reaching 20,000-kVA capacity; the switching on and off at frequent intervals of loads of that magnitude is not an easy proposition.

### Domestic Appliances

Suppliers of electricity who want to develop the domestic load after the war should bear improvements in mind, particularly in respect of the rating of motors for driving such machines as refrigerators and clothes washers in order to reduce maintenance costs, remembering that in most cases these machines are switched direct on to the line without starters. Such machines as well as cookers might also be reduced in weight and made less cumbersome, to the advantage of the housewife. There is still considerable room for the betterment of terminal arrangements on household appliances and for earthing them.

The success of British electrical apparatus has in general depended on thorough co-operation between manufacturer and user, the designer being influenced considerably by the experience of the buyer. Such co-operation and contact are maintained through the manufacturers' engineer representatives operating away from headquarters. Their duties are complex and not always fully understood. So important is it that they should understand the requirements that some of them, possessing an academic background, have, in addition to serving their ordinary engineering apprenticeships, specialised in particular industries. Their activities may be commercial, but of a highly specialised type.

Engineering is the thing being sold; it is not consumed, but results in a monument of utility, which is a lasting tribute to combined effort. In such cases schemes are the commodity, not the individual machines and gear that make up the whole. Costs and prices are certainly kept constantly in mind, as any engineer must do, but the I.E.E. does have regard for "Conditions of Contract," Surely, therefore, this class of man has obtained as wide an experience of technicalities as anyone engaged in other branches of the industry; he is an extremely valuable link and commands respect. While some engineer representatives are members of the I.E.E., the Institution does not include erection or construction engineers, who have to do with the installation of plant and the giving of advice on its operation. Consequently discussions at meetings lose valuable and practical advice which could be contributed by these engineers were they given some inducement to become members.

# CORRESPONDENCE

*Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for correspondents' opinions.*

## New Administrative Association

WHAT is the motive, ulterior or otherwise, for the formation of yet another organisation within the electricity supply industry? Is it not a fact that the industry is at present over-burdened with organisations whose sole object is to pursue their own particular sectional interests?

The exclusiveness of the Electricity Supply Administrative Association is remarkable. We are told that only 39 people within the N.J.B. (Greater London) Area are eligible for membership. The number of electricity undertakings in this area is considerably more than this figure. Perhaps the large London supply and distribution companies have been excluded.

The formation of this Association is an attempt by a small group of people to form themselves into a body of specialists within the administrative structure of the industry. Let us hope that this trend of modern industry does not permeate the lower ranks and bring us face to face with the Electricity Supply Office Boys' Association.

*London, S.W.*1. J. C. WOODVILLE.

## Transformer Restrictions

MOST of your readers interested in transformers will have acquainted themselves with the terms of the Electrical Transformers Order, 1943, which came into force on September 30th. Its intention is to conserve material during the remainder of the war period presumably, and it enforces the use of Amendment No. 1 to B.S.S. 171 of 1936.

Designs of efficient manufacturers were already based on the use of minimum material within the limitations of B.S.S. 171, and gave the reasonable peacetime values of core and copper losses to which we are accustomed, using normal grades of transformer steel and other material. The use of lower-grade electrical sheet steel is mentioned in the Order, and when this becomes available core losses will automatically increase, but the question arose what course to pursue in the meantime.

Accordingly I recently visited the Board of Trade for guidance, and the object of this letter is to pass on the information obtained. This is to the effect that the letter of the Order must be rigidly kept; the losses specified therein must not only be the minimum guaranteed, and aimed at in design, but they or heavier losses must be obtained on test; to obtain lower losses is a legal offence.

In large transformers this may not mean much modification, as the usual losses were somewhat tight at times, but at the other end of the scale we will, for illustration, instance a 5-kVA three-phase, 50-cycle transformer, 6,000-400 V, which with a normal design had a core loss of 95 W. In future the guaranteed core loss must not be less than 130 W and, with this minimum guarantee, test results show not less than 130 or more than 143 W.

This is now law, and no departure is permissible except by individual licence, previously obtained, for every case. The Order covers transformers for overseas use, and where special rating is desired, as for tropical use, the purchaser must specify the nearest suitable size which after he has allowed for de-rating, in actual use, will meet his requirements.

*Hackbridge.* W. C. KENNETT, *Director*, Bryce Electric Construction Co., Ltd.

[Details of the Electrical Transformers Order appeared in our issue of October 8th, p. 464.—Editors, *Electrical Review*.]

## The Early Days

THERE has been considerable interest in the various accounts you have published of the early history of supply undertakings; I wonder whether Mr. John Christie, who was chief engineer at Brighton until a few years ago and was appointed at Londonderry in either 1891 or 1892, would care to tell you anything about the old Derry supply. At the time this supply started (it was purely a street lighting scheme) the firm of Alexander Brown & Sons, Londonderry (with whom I was then an apprentice), secured the contract for the whole of the mechanical part of the undertaking, that is, engines, boilers, etc., together with the street lamp-posts, and why I come into the picture is that, although I was still in my teens, I was given a gang of labourers to erect all the lamp-posts.

Siemens Bros. supplied all the cables and Brockie-Pell arc lamps together with the arc-lighting dynamos; the lamps worked in series on 2,000 V. I am drawing attention to this old station as I think it must have been one of the earliest to start up for high-voltage DC supply, and I am wondering if any photos are available. The low-voltage supply for private lighting did not start for some years afterwards.

I left Brown's to go to Crompton's, and was for some years their expert on rectified arc-lamps for street lighting in the days of the Crompton-Pochin lamp. Afterwards I

went into municipal service; as you may remember, I was chief engineer at Acton from 1904 to 1911 when the Metropolitan Electric Supply Co. took it over.

*Acton.* J. MARTIN BLAIR.

THAT useful publication known as P.E.P. (Political and Economic Planning, 1936) contains the following passage:—"However, it was not until 1881 that the first public supply of electricity was provided in Great Britain. This was achieved through harnessing the power of the River Wey to light the streets of Godalming (Surrey). On this occasion the power cables were laid in the gutters of the streets as there was no legal authority to lay them underground."

Using this interesting item in a recent review of the industry I was told shortly afterwards that it was incorrect, Blackpool gaining this distinction in 1879. It would be helpful if any of your readers can confirm or determine this interesting point.

*Kingston-on-Thames.* W. EGGLETON, *Chairman*, Electricity Committee

[Blackpool certainly had a public lighting scheme in 1879. The *Electrical Review* of October 15th of that year quoted a long description of the arrangements from the *Journal of Gas Lighting*. This said, *inter alia*:—"Dr. Siemens' patent dynamo-electric machine was the one used in producing the light. . . . The dynamo-electric machines are eight in number to produce as many lights and are actuated by large pulleys on a main shaft, 4 in. in diameter, driven by two patent Robey engines, each of which is 16 HP nominal." The lights were said to have an illuminating power equal to "6,000 sperm candles" each. The cables were of copper insulated with gutta percha covered with india rubber and they were carried in 2-in. and 3-in. cast-iron pipes laid underground. But they were inundated with sea water which destroyed the insulation and put the whole scheme out of action. The wires were then mounted on poles and the results seem to have been satisfactory. In spite of this our contemporary ventured the rash opinion that "every trial of electric lighting, however successful, only serves to prove the utter impracticability as a general illuminator, and the impossibility of its ever, in the slightest degree, competing with or interfering with the progress of gas lighting."—Editors, *Electrical Review*.]

## Domestic Electrical Accidents

IT is somewhat perturbing to note the growing number of electrical accidents in domestic circles, particularly when the majority of such accidents could have been prevented. These unfortunate occurrences are bad propaganda for the electrical industry and the time is long overdue for taking steps to combat unsatisfactory electrical installations.

There is no excuse for any electrical engineer who connects switches in the neutral pole of the supply or omits to earth metal cases of domestic appliances in places with conducting floors and other earthed conductors. Unfortunately, however, that type of electrician (?) can carry on with his death-dealing work and the worst that can happen is an inquest with a verdict of "accidental death."

The aims and objects of the National Register of Electrical Installation Contractors are commendable, but of little avail in view of the fact that the Register cannot stop bad tradesmen from continuing to carry out unsafe electrical work. If a doctor or dentist has his name removed from the registers for unprofessional conduct, his career is ended, but not so an electrical contractor, whether he is registered or not.

To prevent domestic electrical accidents all persons carrying out electrical installation work should be licensed on the same lines as doctors and dentists; the Regulations for the Electrical Equipment of Buildings should be made compulsory and persistent breaches of the Regulations should be punishable by law; and qualified inspectors of domestic installations should be appointed on similar lines to the Factory Inspectors.

*Glasgow.* ALEX. MILNE.

## A Missed Opportunity

THE important exhibition at the Institution of Civil Engineers took five months to plan and assemble and the cost must have been very considerable. The main attraction, particularly for women, is the planned kitchen and its equipment, designed to show (in the words of the exhibition leaflet) "a logical sequence in planning" and how "full use is made of the help which engineering science can give."

It is a room about 15 ft. by 7 ft. 6 in., flanked on one side by cupboards of impossible design and, on the other, by a very ordinary earthenware sink on either side of which are wooden representations of a cooker and a refrigerator. Above the refrigerator another wooden model is intended to represent the hot water supply. There is no room for an electric dish-washing machine, and indeed no evidence of points for the iron, the toaster, the electric mixer and other labour-saving aids. The wall cupboards are a potential source of accident every time they are opened as the doors project nearly 2 ft. into a room only 7 ft. 6 in. wide. Although a small laundry is provided there is no place to iron the clothes. Certainly the small hinged table against the kitchen wall is quite unsuitable for this purpose. One looks in vain for an extractor fan to dispel cooking odours and to keep the kitchen cool in summer.

In women's magazines there are many references to the labour-saving devices that the housewife can look forward to after the

war. But if the kitchen is to be limited to a width of 7 ft. 6 in., where is this electrical equipment to go?

It is high time the electrical industry carried out a nation-wide survey of the housewife's views on kitchen planning and equipment, so that the functions of the kitchen can be clearly defined. It will be surprising if the vast majority do not ask for a kitchen roomy enough to incorporate, not only the equipment of a first-rate workshop, but also a recess in which the family may have their meals in comfort. This applies not merely to the working-class home, but to households once accustomed to a resident maid and now compelled to prepare at least the first and last meals of the day themselves.

This kitchen exhibit at the Institution of Civil Engineers is a challenge to the electrical industry and particularly to the manufacturers of electrical domestic equipment. Unless something is done quickly to counter this ridiculous "kitchenette" idea, the industry may find—too late—that there is no room in the four million post-war houses for those labour-saving aids that the housewife expects and that only electricity is able to provide.

*London, W.C.*1. MARY BEALE.

# PERSONAL and SOCIAL

## *News of Men and Women of the Industry*

IN consequence of the promotion of Mr. T. H. Carr to the position of electrical engineer and manager of the Bradford Corporation electricity undertaking, **Mr. A. Haselhurst,** A.L.A.A., A.C.W.A., who was formerly commercial manager, has now been appointed commercial manager and deputy chief official of the Electricity Department.

Mr. Haselhurst commenced his career in 1911 with Cook, Welton & Gemmell, Ltd., with whom he rose from office boy to assistant secretary. In 1926 he joined the Hull Corporation Electricity Department as accounts supervisor, and while he was there he was closely associated with the inauguration of the assisted wiring and domestic hire schemes. He left Hull in 1931 to take up the position of chief clerk with the Willesden electricity undertaking, where he became commercial assistant in 1934. Mr. Haselhurst went to Bradford as commercial manager in 1941.

**Mr. W. H. Dunkley,** B.Sc. (Eng.), A.M.I.E.E., generation engineer of the Hull Corporation electricity undertaking, has been appointed by the Electricity Committee to the position of deputy general manager and **Mr. I. D. Campbell,** technical assistant, becomes generation engineer. The appointments are for the period of the war, and are subject to confirmation thereafter.

In making the recommendations, Mr. D. Bellamy (general manager) said that the appointments were necessary in view of the post-war development of the undertaking, both in generation and distribution, and that the undertaking would have to be reorganised at the end of the war.

The Newport Corporation Electricity and Transport Committee has accepted with regret the resignation of **Mr. N. J. Young,** M.B.E., general manager of the Electricity and Transport Department since 1912, and has placed on record its appreciation of his services to the town. The resignation will take effect from April 9th next. Mr. A. Nichols Moore, whose death was reported in our last issue, was borough electrical engineer and transport engineer at Newport.

On Thursday last week **Mrs. Marguerite Jackson's** picture "Still Life," exhibited at the Royal Academy this year, was presented to the E.A.W. Clubroom by members of the National Executive Committee, of which Mrs. Jackson is chairman. The presentation was made by the Dowager Lady Swaythling, President of the Electrical Association for Women.

**Mr. R. Clough,** chief electrical and mechanical engineer at the Brotton and Carlin How mines of Dorman, Long & Co., Ltd., for thirty years, has retired and has received a presentation from the officials and workmen. **Mr. W. C. Allan,** Newcastle-on-Tyne, has been appointed to succeed Mr. Clough.

**Mr. H. Watson,** one of the original directors of the Holland House Electrical Co., Ltd., has resigned his appointment, and his place has been taken by **Mr. F. Dunnet** who for some years has been manager of the company's Kilmarnock branch.

**Mr. W. R. T. Skinner,** whose appointment as general manager of the Yorkshire Electric Power Co., we recently reported, has now, in addition, been appointed general manager of the Electrical Distribution of Yorkshire, Ltd., and of its subsidiary and associated companies.

**Mr. W. H. Bulpitt,** chairman and managing director of Bulpitt & Sons, Ltd., Birmingham, has recently completed fifty years' connection with the business which was founded by his grandfather about seventy-five years ago.

The Board of the London & North Eastern Railway Co. has agreed, at the request of the Minister of War Transport, to release temporarily **Mr. R. J. M. Inglis,** Divisional General Manager (Scottish Area), for important Government services overseas. During Mr. Inglis' absence, **Mr. T. F. Cameron,** Assistant General Manager (Works & General), will act as Divisional General Manager (Scottish Area), and **Mr. H. W. H. Richards,** Chief Electrical Engineer, will, in addition to his own duties, act as Assistant General Manager (Works & General).

An interesting ceremony took place before the last meeting of the North-West Midlands Joint Electricity Authority, when **Alderman H. Leese** was presented with an inscribed copy of a resolution placing on record an appreciation of the services rendered by him during his

long term of office as chairman from the formation of the J.E.A. in 1928 until this year. At the request of the present chairman (Alderman H. Leason) the vice-chairman (Alderman C. H. Merrey) made the presentation and in doing so paid tribute to the work of Alderman Leese under whose guidance, he said, the Authority had developed enormously since its inception and the benefits of electricity had been made available in the most remote parts of the Authority's area. Several members added their tributes and Alderman Leese briefly responded.

**Mr. H. E. Tauchert**, A.M.I.Mech.E., former managing director of Henry Pels & Co., Ltd., who joined Venner Time Switches, Ltd., over a year ago in an advisory capacity, has recently been appointed manager of their No. 2 factory.

**Capt. A. R. S. Nutting** and **Air Commodore H. Peake** have been appointed to the board of the Westinghouse Brake & Signal Co., Ltd.

**Mr. A. M. Strickland**, B.Sc., A.M.I.Mech.E., has been appointed as a mechanical and electrical engineer with the Public Works Department of the Gold Coast Colony. After being apprenticed to general engineering, he had three years' training with the Metropolitan-Vickers (then Westinghouse) Co. before serving during the last war in the R.E. Signals and Rhine Army Technical College. His technical training was largely obtained at the Salford Royal Technical College and the Manchester College of Technology and he obtained the external B.Sc. (Engineering) degree of London University. After a further period with the Metropolitan-Vickers Co., he had three years as electrical engineer with a mining enterprise in Latin America. In 1925 he joined the Testing Department of the Manchester Corporation electricity undertaking, and he was appointed testing engineer with the Wolverhampton Corporation Electricity Department in 1938, a position he has held until now.

**Mr. N. Burke** and **Mr. C. E. H. Eckersley** have been elected directors of James Howden & Co., Ltd.

## Obituary

**Dr. G. T. Moody.**—We regret to report the death, on October 23rd, of Mr. Gerald Tattersall Moody, D.Sc. He was a director of the Isle of Thanet Electric Supply Co., Ltd., the Burma Electric Supply Co., Ltd., and the Kalgoorlie Electric Power & Lighting Corporation, Ltd.

**Mr. K. Sanderson.**—The death has occurred at the age of 75 of Mr. Kenneth Sanderson, a director of the Scottish Power Co. and the various supply companies associated with it.

**Mr. D. N. Bhaduri.**—The death occurred on October 23rd, as the result of an accident while he was engaged in research work, of Mr. Debendra Nath Bhaduri, B.Sc. (London), Graduate I.E.E. Mr. Bhaduri was only twenty-six years of age.

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**Will.**—**Mr. T. G. Blackwell**, a director of the Metropolitan Electric Supply Co., and other electricity undertakings, left £367,531; with net personalty £261,487.

# Forthcoming Events

**Institution of Electrical Engineers.**—Thursday, November 4th, 5.30 p.m. "Bonded Deposits on Economiser Heating Surfaces," by Messrs. J. R. Rylands, M.Sc. and J. R. Jenkinson, B.Met. "Causes of High Dew-point Temperatures in Boiler Flue Gases," by Mr. W. F. Harlow, Wh.Ex. Joint meeting with the Institution of Mechanical Engineers.

*Wireless Section.*—Wednesday, November 3rd, 5.30 p.m. "Wave Guides in Electrical Communication," by Mr. J. Kemp.

*Mersey and North Wales (Liverpool) Centre.*—Monday, November 1st, 5 p.m. Liverpool Royal Institution, Colquitt Street. "Boiler House Measurement and Control for Efficient Fuel Utilisation," by Messrs. G. H. Barker and A. L. Hancock. Joint meeting with the Liverpool Engineering Society.

*South Midland Centre.*—Monday, November 1st, 6 p.m. James Watt Institute, Birmingham. "The High-pressure Gas-filled Cable," by Messrs. C. J. Beaver and E. L. Davey, B.Sc.—*Students' Section.*—Tuesday, November 9th, 7 p.m. Association Hall, English Electric Co., Stafford. "Turbo-alternator Ventilation," by Mr. H. R. Ogle.

*North Midland Centre.*—Tuesday, November 2nd, 6 p.m. Great Northern Hotel, Wellington Street, Leeds. "Air-blast Circuit-breakers," by Mr. A. R. Blandford.

*North-Eastern Centre.*—Monday, November 8th, 6.15 p.m. Neville Hall, Westgate Road, Newcastle-on-Tyne. "The Protection of Structures Against Lightning," by Mr. J. F. Shipley.

*Western Centre.*—Monday, November 8th, Bristol. "Brains Trust."

*North - Western Centre.* — Saturday, November 6th, 2.30 p.m. Engineers' Club, Albert Square, Manchester. "The High-pressure Gas-filled Cable," by Messrs. C. J. Beaver and E. L. Davey, B.Sc.

**Manchester Statistical Society.**—Saturday, October 30th, 3 p.m. College of Technology, Sackville Street. Dr. B. P. Dudding will speak on the subject of "Quality Control."

**Society of Chemical Industry.**—*Plastics Group.*—Tuesday, November 2nd, 2 p.m. Symposium on "Rubber-like Plastics and their Applications." Joint meeting with the Institution of Rubber Industry and Institute of the Plastics Industry.

**Junior Institution of Engineers.**—Friday, November 5th, 6.30 p.m. 39, Victoria Street, London, S.W.1. "The Synchrophone as an Aid to Post-War Training," by Mr. N. Sandor, M.I.Mech.E., A.M.I.E.E.

*Midland Section.*—Wednesday, November 3rd, 6.30 p.m. James Watt Institute, Birmingham. Annual General Meeting.

**National Smoke Abatement Society.**—Friday, November 5th, 10 a.m. Caxton Hall, Westminster, S.W.1. General meeting followed by conference on "Measures for the Prevention of Smoke in Relation to Plans for Post-War Reconstruction."

**British Coal Utilisation Research Association.**—Wednesday and Thursday, November 10th and 11th. Institution of Mechanical Engineers, Storey's Gate, London, S.W.1. Conference on "Problems in the Utilisation of Small Coals."

# COMMERCE and INDUSTRY

## *Yorkshire Power Costs. B.E.A. Scope Widened.*

### Award Against C.E.B. Upheld

IN the King's Bench Division of the High Court of Justice on October 18th Mr. Justice Tucker had before him in the form of a special case stated by an arbitrator a dispute between the Yorkshire Electric Power Co. and the Central Electricity Board in regard to the price to be paid by the Board to the company for electricity generated.

In his award the arbitrator stated that the Electricity Supply Act, 1936, provided that the cost of production should include the average rate of dividends and interest paid by the company on share and loan capital, and the question at issue between the parties was as to the rates of interest on capital which the company was entitled to reckon in calculating the cost of generating electricity. The arbitrator upheld the contention of the company and the Board now challenged that finding.

His Lordship, in his judgment, said that the Board contended that the words "share and loan capital" in the Act meant the money actually raised, while for the company it was contended that the words meant the nominal value of the share and loan capital. As in this case shares had been issued at a premium and discount had been allowed on loans, there was a difference between the money actually raised and the nominal value of the capital. He held that the contention of the company was correct and therefore the award must stand.

### The British Engineers' Association

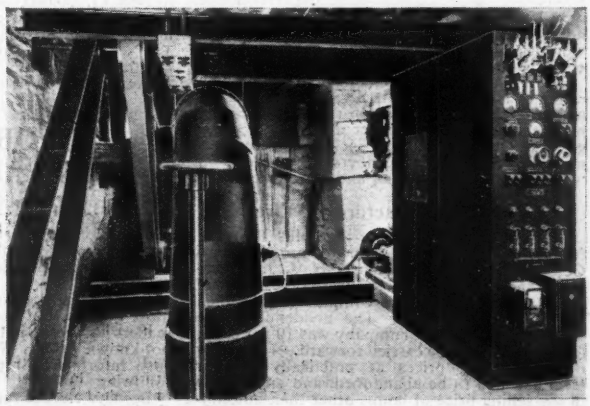
At the annual general meeting of the British Engineers' Association held on October 14th in London the members unanimously supported a recommendation by the Council that membership should be widened to include sectional trade associations whose members are primarily concerned with the mechanical engineering industry. Since the inception of the Association in 1912 membership has been restricted to individual firms, of whom some hundreds now participate in the work of the Association, and it is expected that the extension to which agreement was given at the meeting will facilitate closer co-operation between those with a mutuality of interests.

The Director of the Association, Mr. A. W. Berry, outlined some of the services rendered to members and referred to the close contacts maintained by the Association with the appropriate Government Departments. He referred to the successful outcome of representations to the Chancellor of the Exchequer in respect of tax reserve certificates and also to the submission by the Association of memoranda on the effects on productive industry of excess profits taxation. During the past year, Lt.-Col. H. B. Riggall (director, Ruston & Hornsby, Ltd.) and Mr. W. D. Lancaster (director, Hughes & Lancaster, Ltd.) have been elected as vice-presidents. The Council was re-elected for the ensuing year and, at the subsequent Council meeting, the president, Mr. Cecil Bentham, having been thanked for his services during the past year, was re-elected.

### Mill Conversion for War Production

An old mill situated in the West of England has been converted into a modern engineering workshop and its water wheel replaced by a turbo-alternator to asist the war effort. The new water turbine, which drives a 20-kW alternator through a belt, provides the power for electric lighting and sundry plant and machinery. This alternator is controlled by a switchboard and when necessary it can be connected to a Metropolitan-Vickers motor driving a centrifugal fire pump with a capacity of 180 gallons per minute, and fed by the water which has passed through the turbine, thus providing a system of fire-fighting.

The original lighting consisted of conical iron shades fitted with tungsten lamps mounted directly over each machine, supplemented by high-wattage lamps in shallow type reflectors for general illumination. This system was found to cause excessive glare and harsh shadows, which have now been practically eliminated by a modern installation of "Metrovick" 80-W 5-ft. fluorescent tubes in patent continuous troughing. The rows of continuous troughing are installed in runs over the machines and, in order to avoid the overhead shafting and belting, the fittings are mounted underneath



**The switchboard and water duct in a mill converted for war production**

these obstructions at a height of 7 ft. 6 in., thereby ensuring that the working plane receives the maximum illumination. The scheme was designed to provide a nominal service illumination of the order of 22 ft.-candles, and this has been achieved in practice; the resultant lighting, being well diffused, with freedom from reflected glare and hard shadows, is very suitable for the precision machining being carried out in the factory. This scheme of relighting was planned by engineers of the Metropolitan-Vickers Electrical Co., Ltd., who also supplied the necessary equipment.

## Best Use of "Key" Men

In a memorandum sent to the Controller-General, Machine Tool Control, Ministry of Supply, the Gauge and Tool Makers' Association stresses the need for the retention of "key" men in the gauge and toolmaking industry. It is pointed out that the Minister of Production has recognised that the shortening of the period before the commencement of manufacture is vitally important. To secure this it is essential that the relatively few "key" men concerned should not be "combed out" for the Forces. A prominent aspect of the matter is that the greater employment of women and unskilled labour is dependent upon the more complete tooling and gauging of factories. It is also suggested that there should be greater selection in the recruitment of female and "green" labour so that key men shall not waste valuable time in attempting to train unsuitable people.

Attention is drawn to the disproportionate percentage of skilled men employed by small firms which are unable to use them to the best advantage. It is considered that if any of these concerns are closed down, as seems to be the Ministry's policy, their skilled men should be diverted to "approved" tool and gauge shops.

## Export Control

The Export of Goods (Control) (No. 8) Order, 1943 (S.R. & O. 1943 No. 1476, Stationery Office, 1d. net) extends control to a number of goods and commodities including resistances (resistors) including heating elements; valve holders and cathode-ray tube holders; and vibrators of a kind used in radio-communication equipment.

The existing control (confined to goods of a rating of 1 kVA or over) in respect of condensers (capacitors) and static transformers respectively has been extended to cover all types of these goods. Other alterations include the replacement of the item "rectifiers" by the item "rectifiers, and cells, discs and plates therefor."

## Lamp Manufacture in Eire

At the annual meeting of the Solus Teoranta (the Irish lamp manufacturing company) on October 15th, the chairman, Mr. J. J. Walsh, said that the net profits for the year ended June last were £7,493, as compared with £7.365 for the previous year. The dividend on the £75,000 capital of the company was 10 per cent., leaving £1,124 to be carried forward. The policy of maintaining prices at practically pre-war level had had to be abandoned, and an increase in the selling price of lamps other than automobile types was made. Towards the end of the year all-round wage increases allowed by the Government necessitated another advance in lamp prices.

## Employment of a Typist

The Automatic Coil Winder & Electrical Equipment Co., Ltd., was fined £25, with £10 costs, at Bow Street on October 25th for engaging a shorthand typist otherwise than through a labour exchange. Mr. Douglas Lowe, for the Ministry of Labour, said that the young woman was "mobile" and after she had been engaged by the firm it was advised of this. Arrangements were made for her to take up an appointment with an aircraft factory outside London. She appealed against this but the appeal was dismissed. She was transferred to other work as a shorthand typist but was apparently not satisfied and was re-engaged by the company, a director of which made a statement in which he said the company re-engaged the girl because she had been removed from its employment by "false pretences."

Mr. Anthony Hawke, defending, pleaded guilty, and said it was no secret that the girl was being employed by the company. The labour exchange had for months failed to provide a shorthand typist for the firm. When she got to the aircraft factory the girl found the conditions unsatisfactory and she asked the company to take her back.

## Lighting Economy

A useful leaflet entitled "A Guide to Light without Waste," has been issued by Thorn Electrical Industries, Ltd. This has been prepared to enable factory managements to interpret the Fuel Economy Regulations correctly, and to assist them in obtaining the maximum light in the place where it is wanted for the minimum consumption of electricity. The essentials of good lighting and the avoidance of waste are dealt with, and a list of "Atlas" general purpose lamps is appended.

## Bristol District Heating Plan

It is reported that a detailed scheme, estimated to cost £1,500,000, for the supply of hot water throughout the centre of the city has been submitted to the Bristol Public Works Committee. The scheme, it is said, would operate in conjunction with the Corporation's electricity undertaking.

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# INFORMATION DEPARTMENT

GENERAL inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by our information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

Our extensive records enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the makers of the following:—

BONRAY electric radiator.

EPIC fires.

# Kingston Jubilee

## *A Review of the Electricity Undertaking's Development*

THE first public supply of electricity at Kingston-on-Thames was commenced on October 17th, 1893, and the jubilee of the electricity undertaking was celebrated on October 18th.

The Corporation was granted an Electric Lighting Order in 1891 and following reports from Mr. J. N. Schoolbred and the late Mr. W. H. Preece, application was made for sanction to borrow £16,000 for the purposes of the undertaking. In 1893 it was decided to erect the works on the present site at Down Hall Meadows and Mr. A. H. (now Sir Arthur) Preece submitted specifications for the plant and mains. Tenders from Siemens Bros. & Co., Ltd., for the plant and mains were accepted, and Mr. J. E. Edgecombe was appointed electrical engineer and manager.

### Early Street Lighting

The original plant had a total capacity of 225 kW and consisted of four Belliss & Morcom reciprocating steam engines, driving one 25-kW, two 50-kW and one 100-kW alternators. These gave a supply at 2,100 V, single-phase, 77 cycles. Three Lancashire boilers, each having a capacity of 5,000 lb. of steam per hour, were installed. The supply was transformed down to 105 V for commercial use. Street lighting was introduced shortly after the inception of the undertaking, and two arc-light dynamos with a capacity of 38 kW were installed for this purpose. In the succeeding years many additions were made to the plant to meet the increasing demand.

Since September, 1931, as the result of the bulk supply agreement made between the Corporation and the London and Home Counties J.E.A., the operation of the generating station has been controlled by the latter authority, and the Kingston station has been interconnected with the C.E.B.'s grid system. In 1937 it was decided to centralise the operational control of the switchgear, transformers, generators, etc., by the construction of a new control room, and in December, 1938, during the work of conversion of the 11,000-V switchgear, a disastrous fire occurred at the station, resulting in the destruction of the switchgear with considerable damage to other major equipment.

The importance of the station as a focal point of supply not only to Kingston itself but also through the C.E.B. grid to a wide area around has been recognised by the higher authorities, and following representations and negotiations by Mr. E. J. Jarvis, the present borough electrical engineer, the Central Electricity Board has invited the Corporation to prepare a scheme for the construction of a new generating station with a capacity of 120,000 kW to be erected on a site adjacent to the existing station. Messrs. Preece, Cardew and Rider have been appointed as consulting engineers, and plans for the new station, which is to be erected after the war, have now been approved.

The development of the distribution side of the undertaking has been rapid and by 1933 cables had been laid in every road in the borough. The distribution network is supplied from six ring mains, all of which are interconnected, thus ensuring as far as possible no interruption to supply due to feeder faults.

Various tariffs have been introduced from time to time to encourage the use of electricity. In 1899 a tariff was introduced by which a reduced charge was made for all units consumed in excess of a certain number charged at the higher primary flat rate. Shortly afterwards a deferred payment system was introduced and this was followed in 1904 by a maximum demand system and a special sliding scale for heating, cooking and power consumption. To promote the domestic use of electricity, items of electrical apparatus were let out on hire to consumers at a very early date and exhibitions have been held from time to time. New showrooms, offices and stores were opened in the High Street in 1931 and an assisted wiring scheme was put into operation.

The jubilee celebrations took the form of a wartime lunch, served at the British Restaurant, at which the Mayor of Kingston presided. Among those who attended were Sir Arthur Preece, who prepared the original scheme, and Mr. J. E. Edgecombe, the first engineer and manager. Following the lunch the visitors went on to the electricity works, where photographs and other exhibits were shown illustrating the history and the development of the undertaking.

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## Flameproof Equipment

THE usual quarterly list of electrical apparatus, mining and industrial, for which certificates of flameproof enclosure have been granted by the Mines Department (Coal Division) Ministry of Fuel and Power during the three months ended September 1943, is now available. At the request of the British Electrical & Allied Manufacturers' Association a few copies of the list can be purchased for 1s. 2½d. each from the library, Ministry of Fuel and Power, King's Buildings, Dean Stanley Street, London, S.W.1.

# ELECTRICITY SUPPLY

## *Electrical Threshing.* "*Subsidisation*" *at Salford.*

**Anglesey.**—EXTENSIONS.—The North Wales Power Co., Ltd., is to extend its electricity supply to Open-air House, Llanfairpwll.

**Ashton-under-Lyne.**—POWER STATION TO BE CLOSED DOWN.—Councillor C. L. Wright, chairman of the Electricity Committee, stated at a recent meeting of the Town Council that the C.E.B. did not intend to operate the local generating station after the end of the year. The closing down of the electricity works, he said, involved a good many financial considerations as well as the question of an alternative supply.

**Dartford.**—REMOTE INDICATING APPARATUS.—In order to reduce transport mileage and the time taken in obtaining readings at three distant rectifier substations, remote indicating apparatus has been installed to operate, by means of pilot cables, three ammeters on the main switchboard at the electricity works, thus enabling the shift engineers to take hourly readings. The apparatus used has been designed, made and installed by members of the staff from material taken from the stock of redundant apparatus. The Electricity Committee has expressed appreciation of the work carried out in constructing apparatus, which would have cost £120 to purchase.

**Kirkcudbrightshire.**—THRESHING BY ELECTRICITY.—At a recent meeting the Electricity Committee of the County Council considered a report by the acting county electrical engineer on experiments in threshing by electricity. The Committee approved the engineer's recommendation that for the present the hiring of 10-HP electric motors for threshing purposes should be restricted to farms already on the Council's supply, and that the tariff should be: connection and disconnection charge, £1 10s.; and electricity consumed, 1½d. per kWh. At the council meeting it was explained that the Electricity Committee was trying to bring something new before consumers. It had every hope that the new venture would meet with success and would in due time become popular.

**London.**—LOANS.—St. Marylebone Electricity Committee is seeking sanction to borrow £2,000 for meters, £2,000 for mains and services and £1,000 for electrical apparatus for hire to consumers.

PUMPING PLANT.—The Metropolitan Water Board is to provide electrically driven pumping plants at a total cost of £12,200.

**Middlesbrough.**—ALLOCATION OF PROFITS.—Of the profits earned by the Corporation electricity undertaking during the past year £25,000 is being transferred to the reserve fund and more than £10,000 is being carried forward.

**North Wales.**—HYDRO-ELECTRIC DEVELOPMENT.—Alderman W. Hewitt, J.P., stated at a meeting of the North Wales and South Cheshire Joint Electricity Authority at Llandudno, that a letter had been sent to all members informing them that the North Wales Power Co. had engaged two eminent engineers to investigate the possibility of further development in hydro-electric power, and inviting them to send in particulars of any water power in the area capable of development. The engineers are Mr. Ralph Freeman, of Freeman, Fox & Partner, and Mr. James Williamson. They have already made a preliminary survey and hope to present an interim report by the end of the year.

**Portland.**—FINANCES AND TARIFFS.—In a statement upon the financial position of the electricity undertaking, at a meeting of the U.D.C. Electricity Committee, Mr. F. Baker said the capital outlay had been considerably increased as a result of all mains having been laid underground. Although the undertaking was comparatively new, the total outstanding debt had already been reduced from £75,000 to about £43,000. In 1941-2 there was a surplus on the year's working. The price per kWh for lighting on a quarterly basis was 7d., which did not compare unfavourably with a number of other places in Dorset and adjoining counties. Although in 1942-3 the Council paid an average price of 0·86d. per kWh, consumers in Portland on the two-part tariff who consumed 150, 500 and 750 kWh per quarter, paid an average price of under 2d., just over 1d. and just under 1d. per kWh, respectively, plus war surcharge.

NEW CABLE REQUIRED.—At a meeting of the U.D.C. Electricity Committee it was reported that Smith & Lander proposed to install a further 30-HP motor in their works at Easton Lane. As it was impossible to give the supply by means of existing cables, an expenditure of about £250 would be entailed. The electrical engineer was asked to discuss the matter of this cost with the firm.

**Salford.**—UNECONOMIC CHARGES.—The Corporation Electricity Department, faced with a loss of £36,000 on the undertaking, is to make application to the Electricity Commissioners for permission to charge full economic prices to industrial undertakings by incorporating a coal clause in supply agreements. At a meeting of the Light, Heat and Power Committee last week the Mayor said that owing to the Commissioners' policy they had not been able to get back any of the tremendously increased cost of coal during the past year. The policy seemed to be that undertakings must be prepared to meet losses from reserve funds in order that electricity prices might be kept stable. Hence the undertaking was subsidising firms that could well afford to pay an economic price.

**Stanhope (Co. Durham).**—OVERHEAD POLES ON ALLOTMENTS.—At a meeting of the Parish Council the question of asking the North-Eastern Electric Supply Co., Ltd., to pay compensation for poles erected on allotments owned by the Council was discussed. Councillor Gregory, a well-known local horticulturist, expressed the opinion that electric wires carried over allotments adversely affected the growth of fruit. He suggested that compensation was due therefore from the electricity company.

**Swindon.**—A SUCCESSFUL YEAR.—Last year there was a surplus on the electricity undertaking of £8,838 and an accumulated surplus of £28,261.

**Wallasey.**—DISPUTED ACCOUNT.—After the Electricity Commissioners had stated that they could not appoint an electricity inspector to decide a disputed account except at the request of the consumer, the Corporation Electricity Committee agreed to accept half payment of a disputed account.

## Overseas

**Russia.**—NEW HYDRO-ELECTRIC PROJECT.—A powerful hydro-electric plant is to be built in Turkestan states Moscow Radio (quoted by *Reuter*). The course of the river Syr Darya, which runs through Turkestan to the Aral Sea, is to be diverted for the purpose. An agricultural area is gradually being converted into an industrial zone, primarily for metals and textiles.

**Sweden.**—NEW POWER STATION.—Siljansbygdens Kraftverks AB., a private power-producing company, is to construct a power station on the Ore River in Dalarna province at a cost of about one million kr.—*Reuter's Trade Service.*

# TRANSPORT

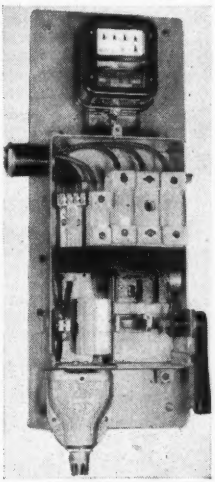
**Darlington.**—TROLLEY-BUS "SHOE" TESTS.—The Corporation transport manager (Mr. W. H. Penman) has been experimenting with a trolley head "shoe" to replace the existing contact wheels on trolley-buses and thus reduce the wear and tear of overhead cables. It is stated that the shoe seems suitable and further tests are to be made after which the device will be brought into use.

**Sunderland.**—UNDERTAKING'S FINANCES.—At a meeting of the Town Council the annual report of the transport undertaking was submitted. It was stated that the reserve fund balance had been considerably increased and the debt on the undertaking reduced to a very low figure.

# Progress at St. Pancras

## *Historical Equipment Exhibited*

LONDON'S first municipal electricity undertaking, St. Pancras, has been holding an interesting display at its showrooms at Camden Town during the past fortnight. The display is intended to show the progress that has been made during the fifty-two years of the undertaking's existence, and it traces by photographs, records and a number of pieces of apparatus the history of electricity supply generally and St. Pancras in particular from the date of the commencement of the supply from the Lower Regent's Park power station, situated in Stanhope Street, on November 9th, 1891. The first portion of the present power station in Royal College Street, originally known as the King's Road station, was built in 1894-5 and commenced generating in October, 1895. Until 1925 electricity was generated at both the stations but in that year the Regent's Park station was shut down.



**St. Pancras house service unit**

The Electricity Department has operated showrooms since as far back as 1905, the existing premises having been opened in 1932, the year Mr. Robert Lee, the present chief engineer and manager, took office.

The undertaking has always more than paid its way and up to 1942 had contributed £438,500 to the relief of the rates. No fewer than 752 miles of mains are now in service and in 1942 there were 53,533 meters on circuit, serving 46,449 consumers. The annual consumption in that year was 69,790,000 kWh, or 618 kWh per head of population. Since 1892 the rates for electricity have been reduced from 6d. to 4d. for lighting, from 3d. to 1d. for power, and from 3d. to ¾d. for cooking and heating. (Actually the last-mentioned rate has been as low as ½d. but has had to be increased during the war.)

Separate sections of the exhibition are devoted to the different aspects of the Department's work. The development of lighting is traced from a Roman pottery lamp of 400 B.C. to the present-day fluorescent lamp. A comparison of service methods is provided by depicting development from a Lundberg service terminal unit of 1897 to a new house service unit designed by the Department's own engineers for post-war use: the latter (constructed mainly from G.E.C. components) has the consumer's fuses in the top portion and the undertaking's fuses below, all protected by the same cover, with the meter mounted above. Other new apparatus, designed by St. Pancras engineers for post-war use include trunking units for housing v.i.r. cables in multi-meter services, and an instrument for determining the power factor of welding plant.

Items of historical interest include a Sir William Thomson electrostatic voltmeter of 1891, an "Ediswan" DC recording voltmeter of 1892, a portable tong-type ammeter of 1893, two early types of motors, and a Bastian water heater of 1905.

# FINANCIAL SECTION

## *Company News. Stock Exchange Activities.*

## Reports and Dividends

**Strand Electric Holdings, Ltd.,** in its accounts for the year to July 11th shows that the dividend from the Strand Electric & Engineering Co., for the year to April 30th was £13,278, as compared with £9,151 in the preceding year. The net profit of the holding company is £12,804 (against £8,686), and after deducting income tax from dividend receivable less tax repayment, there is a balance of £6,398. The dividend for the year is 10 per cent. less tax (against 7½ per cent.), and the balance carried forward is £1,427 (against £779 brought in). During the year the Strand Electric & Engineering Co., absorbed the business of its remaining subsidiary, Mansell & Ogan.

**The Britannia Electric Lamp Works, Ltd.,** reports that the net profit for the year ended April 30th last was £10,809 (against £8,813), after meeting taxation. A sum of £2,500 is again written off against goodwill and trade marks and it is proposed to maintain the dividend at 7 per cent., leaving £13,405 (against £11,221) to be carried forward. The report states that the reduction of output directed by the Board of Trade has been carried out. Reference is made to the difficulties of the labour position.

**Falk, Stadelmann & Co., Ltd.,** report a trading profit for the year ended March 31st of £123,277 as compared with £124,118 for the previous year. After deducting income tax, N.D.C. and staff pensions there is a net profit of £80,703 (against £79,660). The ordinary dividend for the year is again 7½ per cent. and the balance carried forward is raised from £45,224 to £52,878.

**Murex, Ltd.,** reports a profit of £488,990 for 1942-43 (against £598,707). To this are added dividends received, etc., and a balance of £115,339 brought forward and from it are deducted fees, leaving a total of £516,507 (against £625,194). The various reserves receive £410,499, and after meeting the final ordinary dividend of 10 per cent. and bonus of 2½ per cent. (again making 20 per cent. for the year), £119,597 is carried forward.

**Erinoid, Ltd.,** reports a trading profit to July 31st of £121,334, as compared with £105,350 for the preceding year. The net profit is £15,974 (against £25,526) and the ordinary dividend for the year is maintained at 10 per cent., less tax. The balance carried forward is £8,948 (against £8,374 brought in).

**Herbert Morris, Ltd.,** reports a profit for the year ended July 31st of £125,444, as compared with £127,943 for the preceding year. The ordinary dividend is maintained at 20 per cent., tax free, reserve receives £10,000 and the balance carried forward is £67,124 (against £66,711 brought in).

**Richardsons, Westgarth & Co., Ltd.,** are offering to existing shareholders 707,744 ordinary 5s. shares at 5s. 4½d. each, in the proportion of one new share for each five held. The proceeds are to be used to repay on December 31st the balance of the company's 5½ per cent. first mortgage debenture stock (£168,206) at 105 per cent.

**The Nigerian Electricity Supply Corporation, Ltd.,** reports a net working profit for the year ended February 28th of £138,853, as compared with £128,212 for 1941-42, and after providing for tax, debenture interest and redemption, there is an available balance of £31,045 (£37,447). The final dividend is 5 per cent., maintaining the distribution for the year at 8 per cent., less tax, and £11,620 is carried forward (against £10,322 brought in).

**Tube Investments, Ltd.,** reports a small increase in the net profits of its subsidiary companies. A final dividend of 10 per cent. is to be paid on the ordinary stock, making 20 per cent. for the year ending October 31st, and one at the same rate on the liaison ordinary shares.

**Cowans, Sheldon & Co., Ltd.,** are again paying a dividend of 10 per cent. The net profit for the past year was £85,055, as compared with £65,376 in 1941-42. The allocation to taxation reserve is increased from £39,000 to £55,000 and to general reserve from £2,500 to £5,000.

**The British Electric Traction Co., Ltd.,** is maintaining the interim dividend on the deferred stock at 15 per cent.

**Babcock & Wilcox, Ltd.,** are again paying an interim ordinary dividend of 4 per cent.

**The Pressed Steel Co., Ltd.,** is again paying an interim dividend of 10 per cent.

**The Anglo-American Telegraph Co., Ltd.,** has declared a quarterly dividend of ¾ per cent.

## New Companies

**Design & Developments, Ltd.**—Private company. Registered October 11th. Capital, £1,000. Objects: To carry on the business of inventors, designers, manufacturers of, and dealers in, electrical and mechanical apparatus and equipment, including prime movers, transmitting apparatus, etc. Directors: R. E. Froggatt, 134, Orchard Road, Erdington, Birmingham, and F. A. Walker, 36, Jaffray Road, Erdington, Birmingham. Registered office: 50, Cherry Street, Birmingham, 2.

**Anglo-American Fan Co., Ltd.**—Private company. Registered October 18th. Capital, £100. Objects: To carry on the business of designers and manufacturers of, and dealers in, fans, blowers and force and induced draught appliances, etc. Subscribers: Kathleen A. Rolph, 7, Liverpool Road, Kingston Hill, Surrey and C. A. Jage, 77, Parsonage Manorway, Belvedere, Kent. Registered office: Aldwych House, W.C.2.

**Televoice, Ltd.**—Private company. Registered October 11th. Capital, £300. Objects: To acquire the business of electrical dealers carried on by G. A. Harrison and S. James at Station Road, Erdington, as "Etherdene," and to carry on the business of manufacturers of, and dealers in, radio and television sets and

valves, gramophones, etc. Directors: W. D. Bradley, 191, Monmouth Drive, Sutton Coldfield; S. James, 109, George Frederick Road, Sutton Coldfield and G. A. Harrison, 66, Glendon Road, Erdington, Birmingham. Registered office: 11, Somerset Road, Edgbaston, Birmingham.

**Ragosons, Ltd.**—Private company. Registered October 9th. Capital, £1,000. Objects: To carry on the business of manufacturers of, and dealers in, electrical goods and accessories, bulbs, valves, cycle accessories, and radio goods, etc. Subscribers: S. Mason, 505, Rodney House, Dolphin Square, S.W.1 and N. Symes, 36, Netherall Gardens, N.W.3. Secretary: S. Mason. Registered office: Furnival House, 14-18, High Holborn, W.C.1.

**Dorland Electric Co., Ltd.**—Private company. Registered October 14th. Capital, £100. Objects: To carry on the business of manufacturers of, and dealers in, electrical appliances, fittings and instruments, electronic devices for lighting, heating, power, radio and television or other purposes, etc. Subscribers: C. H. Davis and Mrs. D. M. L. Davis, both of 7, Sydney Road, N.8. Registered office: 38, Brompton Road, S.W.3.

**Emerson Radio-Television (1943), Ltd.**—Private company. Registered October 16th. Capital, £100. Objects: To carry on the business of manufacturers of, and dealers in, wireless and television apparatus and accessories, etc. R. Waldo Emerson, 3, St. Anne's Terrace, N.W.8, is the first director.

**Stokes & McKiernan, Ltd.**—Private company. Registered in Dublin October 15th. Capital, £20,000. Objects: To carry on the business of wholesale and retail factors and manufacturers of electrical goods, tractors, agricultural machinery, motor cars, etc. First directors: E. G. Stokes, The Bungalow, O'Callaghan Strand, Limerick, and four others.

## Company Struck Off Register

The name of the following company was struck off the Register on October 22nd, 1943, and is thereby dissolved: D.A.G. Lamp Co., Ltd.

# Companies' Returns

## Statements of Capital

**Clarke, Chapman & Co., Ltd.**—Capital, £550,000 in 7,000 preference shares of £10 and 480,000 ordinary shares of £1. Return dated March 19th, 1943. 6,985 preference and 480,000 ordinary shares issued and fully paid up. Mortgages and charges: Nil.

**Newcastle & District Electric Lighting Co., Ltd.**—Capital, £600,000 in £1 shares. Return dated April 2nd. All shares taken up. £600,000 paid. Mortgages and charges: £350,000.

**South Somerset & District Electricity Co., Ltd.**—Capital, £200,000 in £1 shares. Return dated March 30th, 1943 (filed May 3rd, 1943). All shares taken up. £206,531 5s. paid (including premium of 2s. 4½d. on each of 55,000 shares). Mortgages and charges: Nil.

**C. J. Ferguson & Sons, Ltd.**—Capital, £5,000 in 2,500 cumulative preference and 2,500 ordinary shares of £1. Return dated September 17th. 2,500 preference and 1,802 ordinary shares taken up. £2,802 paid on 1,802 ordinary and 1,000 preference shares. £1,500 considered as paid on 1,500 preference shares. Mortgages and charges: Nil.

**Electric Cables, Ltd.**—Capital, £2,000 in 2,000 shares of £1 each. Return dated June 17th, 1943. 1,000 shares taken up. £1,000 paid. Mortgages and charges: Nil.

**West African Telegraph Co., Ltd.**—Capital, £400,000 in 40,000 shares of £10 each. Return dated July 8th, 1943. 23,109 shares taken up. £231,090 paid. Mortgages and charges: Nil.

**Christy Brothers & Co., Ltd.**—Capital, £225,000 in £1 shares (75,000 preference and 150,000 ordinary). Return dated August 2nd, 1943. All shares taken up. £176,083 paid. £48,917 considered as paid. Mortgages and charges: Nil.

**Lamp Caps, Ltd.**—Capital, £50,000 in £1 shares. Return dated August 4th, 1943. All shares taken up. £50,000 paid. Mortgages and charges: Nil.

## Increases of Capital

**Power Installations, Ltd.**—The nominal capital has been increased by the addition of £15,000 in £1 shares beyond the registered capital of £5,000.

**T. Clarke & Co., Ltd.**—The nominal capital has been increased by the addition of £50,000 in £1 ordinary shares beyond the registered capital of £50,000. All the shares have now been converted into ordinary shares.

## Mortgages and Charges

**Victor Battery Co., Ltd.**—Debenture, charged on the company's undertaking and property, present and future, including uncalled capital, dated October 5th, 1943, to secure £10,000. Holder: Frederick T. Wright, 18, South Way, N.W.11.

**De Renzi Holmes & Co., Ltd.**—Debenture, charged on the company's undertaking and property, present and future, including uncalled capital, dated October 7th, 1943, to secure all moneys due or to become due from the company to Associated Distributors, Ltd., Nottingham.

**Tucker Bros., Electrical Engineers (Essex), Ltd.**—Debenture dated September 27th, to secure all moneys due or to become due from the company to Barclays Bank, Ltd., charged on the company's undertaking and property, present and future, including uncalled capital.

# Bankruptcies

**G. A. Weston,** electrical contractor and engineer, 5-6, Roman Wall House, Crutched Friars, London, E.C.3.—Last day for receiving proofs for dividend, November 3rd. Trustee, Mr. L. A. West, Bankruptcy Buildings, Carey Street, London, W.C.2, Senior Official Receiver.

**F. Arrowsmith,** 11, Mancroft Terrace, Bolton, carrying on business as a radio dealer at 34, Great Moor Street, Bolton; 8, Bolton Street, Bury; 142, Blackburn Road, Accrington; and 8, Darwen Street, Blackburn.—Orders made September 21st, 1943, refusing bankrupt's discharge.

# STOCKS AND SHARES

TUESDAY EVENING.

CONDITIONS in the Stock Exchange vary but little week by week, so far as the fundamentals are concerned. Abundance of money is one of the principal continuing factors governing the markets; money which cannot be employed in new issues for the simple reason that there are so few of the latter. Capital is therefore compelled to accept existing securities. A slackening of demand for certain of the front-rank industrials became apparent in the declines which started a week ago. It is noticeable, however, that when a fall occurs, there seems to be support ready to take what stock comes on offer. Gilt-edged securities retain their previous strength. Southern Railway 5 per cent. preference has again put on 1½ points. London Passenger Transport senior issues show no quotable change. A buyer last week took a substantial amount without disturbing the prices by so much as an eighth.

**Price Fluctuations**

Equipment and manufacturing shares are irregular in their price fluctuations. Callender's have lost 2s. 6d., going back to 98s. 9d. Aron Electrics at 55s. have regained the deduction of the net dividend of 1s. 6d. Electric Constructions at 51s. 3d. are ⅛ higher. In the preference list, Associated Electrical eights put on 1s. to 39s. On the other hand, Edmundsons 7 per cent. preference at 32s. 9d. are ⅛ down. Electric Finance & Securities have been wanted by reason of the comparatively good yield, £4 13s. 4d. per cent., which they offer. Cable & Wireless stocks attract little notice: the 5½ per cent. preference is lower at 109½. Upon maintenance of the usual interim dividend, Babcock & Wilcox hardened to 48s. 6d. Vickers, however, are again a few pence down, at 18s. 6d. A few sellers appeared of British Electric Traction deferred stock and the price, at 1105, is 20 points lower. Bournemouth & Poole are something of a feature in the electricity supply group, being 1s. 6d. higher at 61s. De la Rue shares have recovered 10s. to 8¾.

**Scottish Hydro-Electric**

The North of Scotland Hydro-Electric Board has received authority from the Secretary of State for Scotland, with the Treasury's approval, to borrow up to £100,000 for the payment of preliminary expenses and interest during the period prior to the commencement of trading operations. The announcement has had no effect upon the price of the Scottish electricity supply companies. Scottish Power ordinary shares hold their rise of last week at 38s. 6d. Clyde Valley shares are 1s. higher than this. Both companies pay dividends of 8 per cent. on their ordinary shares and the respective yields at the present prices are £4 4s. 4d. and £4 1s. 0d. per cent.

**Overseas**

Montreal Power shares have failed to recover from last week's fall of 5¾ which followed the proposal that the company shall be expropriated for the benefit of the inhabitants in the Province of Quebec. Shawinigan Water has rallied a point to 17½, and other Canadian utilities are unchanged. Mexican Light & Power 5 per cent. firsts at 110½ have gained 3, and Rio Tramways fives at 107½ are 2 better. Atlas Electrics at 7s. 3d. have receded 6d., there being a measure of disappointment at the lack of encouraging news about that white elephant, the Montevideo Tramways. The shares, at this present juncture, are a sheer speculation. A decline of 6d. to 24s. in Anglo-Portuguese Telephones was ascribed to sales for executors' accounts. Perak Hydro-Electrics fell back to 13s. 6d.

**Anglo-Argentine Trams**

Anglo-Argentine Tramways shares and stocks have given way on the announcement that the company's allotment of capital in the Buenos Aires Transport Corporation is to be cut down by 21 million pesos. The news was none the more palatable from the fact of its having been vaguely anticipated. The cut amounts to rather over 10 per cent. of the Anglo-Argentine Tramways' capital in the Corporation. If it were felt that this reduction would not be carried further, possibly the prices of Anglo-Argentine Tramways stocks would have remained unchanged —might possibly have gone a little better— but with nothing to assure the holder that a similar procedure may not be adopted in years to come, he is naturally unwilling to add to his present stock. Some of the proprietors argue that there is little likelihood of anything being gained from the step which is now forced upon the company.

**Radio Shares**

The increase in the dividend on Electric & Musical Industries shares from 6 to 8 per cent., has had no further effect upon the price, which, as mentioned last week, rose to 26s. 6d. after being down to 25s. 9d. The current level of 26s. ex dividend affords a meagre yield to present-day buyers, but for a long time past the shares have been valued on their post-war prospects and not on actual performance. The company is assumed to stand in the forefront of those which will greatly benefit from the re-introduction of television after the war. In addition to this, the E.M.I. Company is thought to have

(*Continued on page* 592)

# ELECTRICAL INVESTMENTS

## *Prices, Dividends and Yields*

| Company | Dividend Previous | Dividend Last | Middle Price Oct. 26 | Rise or Fall | Yield p.c. £ s. d. |
|---|---|---|---|---|---|
| **Home Electricity Companies** | | | | | |
| Bournemouth and Poole .. .. | 12½ | 12½ | 61/– | +1/6 | 4 1 2 |
| British Power and Light .. .. | 6 | 7 | 32/6 | .. | 4 4 9 |
| City of London .. | 7 | 7 | 28/– | .. | 5 0 0 |
| Clyde Valley .. | 8 | 8 | 39/6 | .. | 4 1 0 |
| County of London | 8 | 8 | 40/6 | .. | 3 19 0 |
| Edmundsons: 7% Pref. .. | 7 | 7 | 32/9 | –⅛ | 4 5 6 |
| Ord. .. .. | 6 | 6 | 28/6 | .. | 4 4 3 |
| Elec.Dis.Yorkshire | 9 | 9 | 44/– | .. | 4 1 10 |
| Elec. Fin. and Securities .. | 12½ | 12½ | 53/6xd | +9d. | 4 13 4 |
| Elec. Supply Corporation .. | 10 | 10 | 46/– | .. | 4 7 0 |
| Isle of Thanet .. | Nil | Nil | 18/– | .. | — |
| Lancs. Light and Power .. | 7½ | 7½ | 34/6 | .. | 4 7 0 |
| Llanelly Elec. .. | 5½ | 6 | 25/6 | .. | 4 14 1 |
| Lond.Assoc.Electric | 4 | 3 | 23/6 | .. | 2 11 0 |
| London Electric | 6 | 6 | 27/6 | .. | 4 7 3 |
| London Power Red. Deb. .. .. | 5 | 5 | 103½ | .. | 4 16 7 |
| Metropolitan E.S. | 8 | 8 | 41/– | .. | 3 18 0 |
| Midland Counties | 8 | 8 | 39/– | .. | 4 2 0 |
| Mid. Elec. Power | 9 | 9 | 42/6 | .. | 4 4 9 |
| Newcastle Elec... | 7 | 7 | 31/– | .. | 4 10 5 |
| North Eastern Elec.: Ordinary .. | 7 | 7 | 32/6 | .. | 4 16 2 |
| 7% Pref. .. | 7 | 7 | 33/6 | .. | 4 3 7 |
| Northampton .. | 10 | 10 | 47/6 | .. | 4 4 0 |
| Notting Hill 6% Pref. (£10) .. | 6 | Nil | 10 | .. | — |
| Northmet Power: Ordinary .. | 7 | 7 | 38/– | .. | 3 13 8 |
| 6% Pref. .. | 6 | 6 | 29/6 | .. | 4 0 0 |
| Richmond Elec. . | 6 | 6 | 26/– | .. | 4 12 4 |
| Scottish Power .. | 8 | 8 | 38/6 | .. | 4 4 4 |
| Southern Areas | 5 | 5 | 22/– | .. | 4 10 11 |
| South London .. | 7 | 7 | 26/6 | .. | 5 5 8 |
| West Devon .. | 5 | 5 | 23/6 | .. | 4 5 0 |
| West Glos. .. | 4½ | 3½ | 24/– | .. | 2 18 4 |
| Yorkshire Elec. . | 8 | 8 | 41/– | .. | 3 18 0 |
| **Overseas Electricity Companies** | | | | | |
| Atlas Elec. .. | Nil | Nil | 7/3 | –6d. | — |
| Calcutta Elec. .. | 7* | 6* | 37/6xd | .. | 3 4 0 |
| Cawnpore Elec. . | 10 | 10 | 35/6 | .. | 5 12 8 |
| East African Power | 7 | 7 | 33/6 | .. | 4 3 7 |
| Jerusalem Elec. | 7 | 5 | 28/– | .. | 3 11 5 |
| Kalgoorlie (10/–) | 5 | 5 | 10/– | .. | 5 0 0 |
| Madras Elec. .. | 4* | Nil | 22/6 | .. | — |
| Montreal Power | 1½ | 1½ | 22 | .. | 6 16 4 |
| Palestine Elec."A" | 4* | 5* | 41/– | .. | 2 8 10 |
| Perak Hydro-elec. | 6 | 7 | 13/6 | –6d. | — |
| Shawinigan Power | 83cts. | 90cts. | 17½ | +1 | — |
| Tokyo Elec. 6% | 6 | 6 | 22 | .. | — |
| Victoria Falls Power | 15 | 15 | 4⅛ | .. | 3 9 7 |
| Whitehall Inv.Pref. | — | — | 25/– | .. | 4 0 0 |

| Company | Dividend Previous | Dividend Last | Middle Price Oct. 26 | Rise or Fall | Yield p.c. £ s. d. |
|---|---|---|---|---|---|
| **Public Boards** | | | | | |
| Central Electricity: | | | | | |
| 1955–60 (Civil Defence) .. | — | 3 | 99½ | .. | 3 0 4 |
| 1955–75 .. | 5 | 5 | 113½ | .. | 4 8 0 |
| 1951–73 .. | 4½ | 4½ | 107 | .. | 4 4 1 |
| 1963–93 .. | 3½ | 3½ | 102 | .. | 3 8 8 |
| 1974–94 .. | 3½ | 3½ | 98½ | .. | 3 6 0 |
| LondonElec.Trans. Ltd. .. .. | 2½ | 2½ | 97 | .. | 2 11 3 |
| London & Home Counties 1955–75 | 4½ | 4½ | 111 | .. | 4 1 1 |
| Lond.Pass.Trans.: A .. .. | 4½ | 4½ | 115½ | .. | 3 18 0 |
| B .. .. | 5 | 5 | 116½ | .. | 4 5 10 |
| C .. .. | 2⅞ | 3 | 69 | .. | 4 7 0 |
| WestMidlandsJ.E.A. 1948–68 .. | 5 | 5 | 109 | .. | 4 11 9 |
| **Telegraph and Telephone** | | | | | |
| Anglo-Am. Tel.: Pref. .. .. | 6 | 6 | 115½ | .. | 5 4 0 |
| Def. .. .. | 1½ | 1½ | 27½ | .. | 5 9 1 |
| Anglo-Portuguese | 8 | 8 | 24/– | –6d. | 6 13 4 |
| Cable & Wireless: 5½ Pref. .. | 5½ | 5½ | 109½ | –½ | 5 0 6 |
| Ord. .. .. | 4 | 4 | 77½ | .. | 5 3 3 |
| CanadianMarconi$1 | Nil | 4cts. | 9/– | –6d. | — |
| Globe Tel. & Tel.: Ord. .. .. | 8¼* | 5* | 38/– | .. | 2 12 8 |
| Pref. .. .. | 6 | 6 | 29/– | .. | 4 2 9 |
| Great NorthernTel. (£10) .. .. | Nil | Nil | 23½ | .. | — |
| Inter. Tel. & Tel. | Nil | Nil | 16 | .. | — |
| Marconi-Marine.. | 7½ | 7½ | 32/9 | .. | 4 11 7 |
| Oriental Tel. Ord. | 16 | 10 | 45/6 | .. | — |
| Telephone Props. | 6 | Nil | 16/– | .. | — |
| Tele.Rentals (5/–) | 10 | 10 | 10/6 | .. | 4 15 3 |
| **Traction and Transport** | | | | | |
| Anglo-Arg.Trans.: First Pref. (£5) | Nil | Nil | 3/6 | .. | — |
| 4% Inc. .. | Nil | Nil | 11 | –1 | — |
| Brit.Elec.Traction: Def. Ord. .. | 45 | 45 | 1105 | –20 | 4 1 6 |
| Pref. Ord. .. | 8 | 8 | 175 | .. | 4 11 5 |
| Bristol Trams .. | 10 | 10 | 52/– | .. | 3 17 0 |
| Brazil Traction .. | $1 | $1½ | 29 | –¼ | — |
| Calcutta Trams.. | 5½ | 6½ | 40/6 | –6d. | 3 4 2 |
| Cape Elec. Trams | 5 | 6 | 24/– | .. | 5 0 0 |
| Lancs. Transport | 10 | 10 | 44/3 | .. | 4 10 4 |
| Mexican Light: 1st Bonds .. | 5 | 5 | 110½ | +3 | 4 10 6 |
| Rio 5% Bonds .. | 5 | 5 | 107½ | +2 | 4 13 0 |
| Southern Rly.: 5% Prefd. .. | 5 | 5 | 76½ | +½ | 6 10 7 |
| 5% Pref. .. | 5 | 5 | 111½ | +1½ | 4 9 8 |
| T. Tilling .. | 10 | 10 | 58/– | .. | 3 9 0 |
| West Riding .. | 10 | 10 | 43/– | .. | 4 13 0 |

(*Continued on next page*)

* Dividends are paid free of Income Tax.

| Company | Dividend Previous | Dividend Last | Middle Price Oct. 26 | Rise or Fall | Yield p.c. £ s. d. |
|---|---|---|---|---|---|
| **Equipment and Manufacturing** | | | | | |
| Aron. Elec. Ord. . | 10 | 15 | 55/–xd | +1/6 | 5 9 1 |
| Assoc. Elec. : * | | | | | |
| Ord. .. .. | 10 | 10 | 50/6 | .. | 3 19 0 |
| Pref. .. .. | 8 | 8 | 39/– | +1/– | 4 2 1 |
| AutomaticTel.&Tel. | 12½ | 12½ | 59/6 | .. | 4 4 0 |
| Babcock & Wilcox | 11 | 11 | 48/6 | +6d. | 4 10 7 |
| British Aluminium | 10 | 10 | 47/– | .. | 4 5 1 |
| British Insul. Ord. | 20 | 20 | 5½ | .. | 3 14 4 |
| British Thermostat (5/–) .. .. | 18½ | 18½ | 19/–xd | .. | 4 17 4 |
| British Vac.Cleaner (5/–) .. .. | 15 | 30 | 27/6 | .. | 5 9 1 |
| Brush Ord. (5/–) | 6 | 8 | 9/3 | .. | 4 6 6 |
| Burco (5/–) .. | 15 | 15 | 16/– | .. | 4 13 9 |
| Callender's .. | 15 | 20 | 98/9 | –¼ | 4 1 0 |
| ChlorideElec.Storage | 15 | 15 | 82/6 | .. | 3 13 0 |
| Cole, E. K. (5/–) | 7 | 10 | 26/6 | –6d. | 1 17 9 |
| Consolidated Signal | 17 | 24 | 5½ | .. | 4 3 6 |
| Cossor, A. C. (5/–) | 7½* | 10* | 23/6 | +6d. | 2 2 6 |
| Crabtree (10/–) .. | 17½ | 17½ | 39/9 | .. | 4 8 0 |
| Crompton Parkinson Ord. (5/–) .. | 20 | 20 | 26/– | .. | 3 17 0 |
| E.M.I. (10/–) .. | 6 | 8 | 26/–xd | .. | 3 1 7 |
| Elec.Construction | 10 | 12½ | 51/3 | +¼ | 4 17 6 |
| Enfield Cable Ord. | 12½ | 12½ | 58/– | .. | 4 6 2 |
| English Electric.. | 10 | 10 | 48/– | .. | 4 3 4 |
| EnsignLamps(5/–) | 25 | 25 | 22/6 | .. | 5 11 1 |
| Ericsson Tel. (5/–) | 22* | 20* | 51/6xd | .. | 1 18 10 |
| Ever Ready (5/–) | 40 | 40 | 39/6 | .. | 5 1 3 |
| Falk Stadelmann | 7½ | 7½ | 32/– | .. | 4 13 9 |
| Ferranti Pref. .. | 7 | 7 | 29/6 | .. | 4 15 0 |
| G.E.C. : Pref. .. | 6½ | 6½ | 32/– | .. | 4 1 3 |
| „ Ord. .. | 17½ | 17½ | 91/– | .. | 3 17 0 |
| Greenwood&Batley | 15 | 15 | 42/6 | .. | 7 1 2 |
| HallTelephone(10/–) | 12½ | 12½ | 25/9 | .. | 4 17 0 |
| Henley's (5/–) .. | 20 | 20 | 25/3 | .. | 3 19 3 |
| 4½% Pref. .. | 4½ | 4½ | 23/– | .. | 3 18 3 |
| Hopkinsons .. | 15 | 17½ | 62/– | .. | 5 13 0 |
| India Rubber Pref. | 5½ | 5½ | 21/6 | .. | 5 2 4 |
| Intl. Combustion | 30 | 30 | 6½ | .. | 4 16 0 |
| Johnson & Phillips | 15 | 15 | 69/6 | .. | 4 6 4 |
| LancashireDynamo | 20 | 22½ | 92/9 | .. | 4 17 0 |
| Laurence,Scott(5/–) | 15 | 12½ | 11/6 | .. | 5 8 8 |
| London Elec.Wire | 7½ | 7½ | 32/6 | .. | 4 12 3 |
| Mather & Platt .. | 10 | 10 | 51/3 | .. | 3 18 9 |
| Metal Industries(B) | 5 | 8 | 45/– | .. | 3 11 2 |
| Met.Elec.CablePref. | 5½ | 5½ | 21/3 | .. | 5 3 6 |
| Murex .. .. | 20 | 20 | 5¼ | –¼ | 3 18 9 |
| Pye Deferred (5/–) | 25 | 25 | 25/– | .. | 5 0 0 |
| Revo (10/–) .. | 17½ | 17½ | 40/– | .. | 4 7 6 |
| Reyrolle .. | 12½ | 12½ | 70/– | .. | 3 11 5 |
| Siemens Ord. .. | 7½ | 7½ | 34/9 | .. | 4 6 4 |
| Strand Elec. (5/–) | 7½ | 10 | 7/9 | .. | 6 9 0 |
| Switchgear&Cowans (5/–) .. | 10 | 20 | 18/– | .. | 5 11 1 |
| T.C.C. (10/–) .. | 5 | 5 | 20/– | .. | 2 10 0 |
| T.C. & M. .. | 10 | 10 | 53/– | .. | 3 15 6 |
| TelephoneMfg.(5/–) | 9 | 9 | 11/6 | .. | 3 18 3 |
| Thorn Elec. (5/–) | 20 | 20 | 21/9 | .. | 4 12 0 |
| Tube Investments | 20 | 20 | 93/– | .. | 4 6 2 |
| Vactric (5/–) .. | Nil | Nil | 13/6 | –3d. | — |
| Vickers (10/–) .. | 10 | 10 | 18/6 | –3d. | 5 8 1 |
| WalsallConduits(4/–) | 55 | 55 | 45/– | .. | 4 17 9 |
| Ward & Goldstone (5/–) .. .. | 20 | 20 | 26/– | .. | 3 17 0 |
| WestinghouseBrake | 10 | 12½ | 67/3 | .. | 3 14 1 |
| West, Allen (5/–) | 7½ | 7½ | 7/– | .. | 5 7 2 |

* Dividends are paid free of Income Tax.

## Stocks and Shares (*Continued from page* 590)

an interest in various other branches of the radio industry, all of which are likely to contribute to earnings expected by the optimists to show remarkable expansion under peace conditions. Business in this department is still at a somewhat low ebb as compared with the activity which prevailed a few weeks ago. Philco have varied between 14s. 3d. and 13s. 6d. Cossor dropped to 23s., recovering to 23s. 6d. Other members of the group, where their prices have changed, are a trifle easier, E. K. Cole, for instance, falling 6d. to 26s. 6d.

### Shares on Offer

The recent rise in the price of Brush Electrical Engineering 5s. ordinary shares has brought in a few thousand to the market, where they are on offer at 9s. 7½d. The dividend last June was raised from the previously-paid 6 per cent. to 8 per cent. and, calculated on the latter dividend, the present price gives a return of £4 3s. per cent. on the money. The dividend is paid once a year. An exactly similar yield is available from the 5,000 English Electric £1 ordinary shares which can be bought at 48s. The company has distributed 10 per cent. annually for the past few years and the dividend is due in March. General Electrics can be bought at 91s. 6d., returning £3 16s. 6d., and Crompton Parkinson " A " ordinary shares, of 5s. each, are obtainable at 26s. 3d., June and December dividend, to return £3 16s. per cent.

### Nigerian Electricity and E.P.T.

The Nigerian Electricity Supply Corporation has brought up its total dividend for the year to 8 per cent. as in the previous year. The company is to be treated on the same basis for taxation as the Nigerian mines. Anticipation awaits with considerable attention an official pronouncement on the taxation point. The Nigerian mines have argued that they are entitled to some E.P.T. concession because of the wasting nature of their assets, and the Treasury, after long delay, is expected to make a conciliatory statement in the course of the next week or so. If relief is afforded in the matter of E.P.T., this will naturally affect the Nigerian Electricity Supply Corporation, whose main source of revenue is the mines. The price of the shares is 24s. 6d., giving a return at that price, on the 8 per cent. dividend, of 6½ per cent.

# NEW PATENTS

## *Electrical Specifications Recently Published*

*The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification* (1*s. each*) *may be obtained from the Patent Office*, 25, *Southampton Buildings, London, W.C.*2.

H. T. ARNOLD, S. Lazarus and Metropolitan-Vickers Electrical Co., Ltd.—"Circuit arrangements for direct current dynamo-electric machines." 4308. March 31st, 1942. (556437.)

Arrow Electric Switches, Ltd.—"Electric switches having automatic tripping means." 4394/42. April 12th, 1941. (556438.)

Baker & Co., Inc.—"Electrical resistance wire." Cognate applications 4227/42, 4228/42, 4229/42, 4230/42. February 11th, 1941. (556431.)

Bendix Aviation Corporation.—"Electromagnetically operated valves." 10465/43. December 26th, 1940. (Divided out of 556520.) (556547.)

Birmingham Electric Furnaces, Ltd., and P. F. Hancock.—"Gaseous atmospheres for use in connection with the heat-treatment of materials." 6394. May 12th, 1942. (556561.)

British Thomson-Houston Co., Ltd.—"Electric glow switches." 3875/42. March 26th, 1941. (556428.) "Impulse-protected electric fuses." 5447/42. April 24th, 1941. (556491.) "Time delay electric relays." 10254/42. July 23rd, 1941. (556511.) "Electric valve circuits for controlling the supply of alternating current to a load circuit." 1345/42. February 3rd, 1941. (556521.) "Lighting fixtures." 5043/42. April 18th, 1941. (556531.) "Fluorescent electric lamps." 6438/42. May 16th, 1941. (556536.)

T. A. Butler, and Pye, Ltd.—"Electric contacts." 8174. June 15th, 1942. (556452.)

S. G. Carn, and Pye, Ltd.—"Electric couplings." 6240. May 8th, 1942. (556535.)

English Electric Co., Ltd., and L. Williams.—"Speed governor for prime mover." 6644. May 15th, 1942. (556446.)

A. D. Ferguson and Metropolitan-Vickers Electrical Co., Ltd.—"Electric cable terminals." 7191. June 6th, 1941. (556548.)

E. R. Goldfield.—"X-ray tube safety switch." 4287. March 31st, 1942. (556434.)

Hazeltine Corporation.—"Vacuum electron-discharge tubes." 568/42. March 8th, 1941. (556427.)

F. W. W. Highfield.—"Electric dynamometer systems for testing engines." 1127. August 8th, 1942. (556569.)

Landis & Gyr Soc. Anon.—"Maximum demand tariff meters." 4680/42. May 5th, 1941. (556488.)

Londex, Ltd., and W. L. Stern.—"Electrically operated devices for liquid level regulation." 5764. April 29th, 1942. (556484.)

Morgan Crucible Co., Ltd., and C. J. Hews.—"Electric current collecting brushes or the like." 2763. March 2nd, 1942. (556465.)

Morgan Crucible Co., Ltd., and L. W. Miller.—"Variable electric resistances." 2762. March 2nd, 1942. (556464.)

J. F. O'Brien.—"Electricity conductor unit." 5608/42. April 26th, 1941. (556482.)

Philips Lamps, Ltd. (Naamlooze Vennootschap Philips' Gloeilampenfabrieken).—"Electron-discharge tubes." 1211. January 28th, 1942. (556461.)

Plessey Co., Ltd.—"Variable electrical resistances." 10032/42. October 1st, 1941 (556510.)

Radio Corporation of America.—"Film feeding mechanism." 8383/42. June 30th, 1941. (556503.) "Photo-cell hum demodulators." Cognate applications 10753/42 and 10754/42. July 31st, 1941. (556568.)

Stackpole Carbon Co.—"Apparatus for regulating the output of dynamo-electric generators." 7486/42. June 21st, 1941. (556501.)

Standard Telephones & Cables, Ltd.—"Television signal transmission systems." 4163/42. January 10th, 1941. (556430.) "Electric insulating materials, more particularly dielectrics for condensers." 4162/42. January 9th, 1941. (556526.) "Electron-discharge apparatus." 4480/42. April 4th, 1941. (556530.) "Electric rectifier element and stack." 4049/43. June 16th, 1942. (556545.) "Application of fluorescent material to electron tubes." 9211/42. July 5th, 1941. (556565.)

Standard Telephones & Cables, Ltd. (International Standard Electric Corporation).—"Radio direction-finders." 10369. July 24th, 1942. (556567.)

Standard Telephones & Cables, Ltd., and C. W. Earp.—"Radio beacons." 4507. April 3rd, 1942. (556476.)

B. J. Starnecki and S. Witkowski.—"Radio high-frequency oscillator." 4590. April 8th, 1942. (556470.)

Westinghouse Electric International Co.—"Cathode structures." 8626/42. June 24th, 1941. (556505.)

Wilcolator Co.—"Control of electric heating elements, particularly in ovens." 7402/42. June 20th, 1941. (556499.)

S. R. Wilkins and Automatic Coil Winder & Electrical Equipment Co., Ltd.—"Protective systems and apparatus for circuits utilising rectified or unrectified AC." 4210. March 30th, 1942. (556467.)

# TRADE MARK APPLICATIONS

THE following applications have been made for British trade marks. Objections may be entered within a month of October 20th:

VELLITE. No. 621,338, Class 11. Apparatus, fittings, and installations for lighting.—The Kingsland Engineering Co., Ltd., 106-108, Kingsland Road, London, E.2.

TRUFOLITE. No. 623,865, Class 11. Electric lighting fittings.—Revo Electric Co., Ltd., Britannia Works, Groveland Road, Tividale, Tipton, Staffs.

Design only. No. 623,348, Class 17. Rubber, reclaimed rubber, synthetic rubber and articles (not included in other classes) made of these materials.—Sterling Cable Co., Ltd., 25, Queensway, Enfield, Middlesex.

# CONTRACT INFORMATION

## *Accepted Tenders and Prospective Electrical Work*

## Contracts Open

*Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.*

**Edinburgh.**—November 18th. Corporation Electricity Department. Paper-insulated cables Specification No. 189, from Electrical Engineer's Office, Dewar Place.

**Macclesfield.**—November 17th. Electricity Department. 11-kV switchgear. (October 15th.)

**Manchester.** — November 5th. Electricity Department. 10,000-kVA transformer. (October 22nd.)

**Wick.**—November 22nd. Town Council. Electric lighting work in erection of fourteen blocks comprising 40 houses. Specifications from burgh surveyor (fee £2 2s.). Tenders to town clerk.

## Orders Placed

**London.**—STOKE NEWINGTON.—Electricity Sub-Committee. Accepted. Renewal of battery plates (£72).—Pritchett & Gold.

**West Hartlepool.**—Corporation. Accepted. Replacement of a motor control panel (£215).—B.T.H. Co.

## Contracts in Prospect

*Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.*

**Ardwick.**—Works additions; Henry Matthews & Son (Builders), Ltd., 129, Stockport Road.

**Batley.**—Additional nurses' home, for Batley and District Hospital, Carlinghow Hill; secretary.

**Billingham-on-Tees.**—Fire station, Grosvenor Road; N.F.S. divisional officer.

**Blackley.**—Works pump house; Russell Building & Contracting Co., Ltd., 165, Plymouth Grove, Chorlton-on-Medlock.

**Blyth.**—Two kitchens; borough engineer, Town Hall.

**Brighton.**—Erection of cooking depot (2,000 meals daily), Loder Road; provision of thirteen school canteens; and restoration of school clinic; borough engineer.

**Bristol.**—Maternity home at Mortimer House, Clifton; H. M. Webb, borough engineer, 7, College Fields, Clifton, Bristol.

**Brixworth.**—Farm workers houses (14); A. Hamson & Son, Ltd., Rose Mount, Brixworth, Northants.

**Chesterfield.**—Rehabilitation unit at Brambling House, containing 20 wards, gymnasium, recreation, dining and billiards room (electrical work); secretary, Chesterfield Royal Hospital.

**Chorlton-on-Medlock.**—Motor works additions for G. Wall, Ltd., motor agents; W. Longworth, architect, 76, Crofts Bank Road, Urmston.

**Essex.**—Additional accommodation for juniors and infants, South Hornchurch Council School; J. Stuart, county architect, County Hall, Chelmsford.

**Harrow.**—Erection of nursery, Vancouver Road; A. E. Morrison (Contractors), Ltd.

**Hemel Hempstead.**—Central kitchen (£3,755), at St. John's Hall, Boxmoor; borough surveyor, Town Hall, High Street, Boxmoor.

**Hull.**—New hospital buildings; secretary, Victoria Hospital for Sick Children, Park Street.

**Hulme.**—Works extensions; A. McDonald, architect, 637, Mauldeth Road W., Chorlton-cum-Hardy.

**Jarrow-on-Tyne.**—Offices and extensions, for the Mercantile Dry Dock Co., Ltd.; T. A. Page, Son & Bradbury, King Street, South Shields.

**London.**—ST. MARYLEBONE.—Workshop extensions, 19-22, Crawford Street; W. H. Scanlan.

**Macclesfield.**—New R.C. schools; Rev. H. R. Kelly, The Presbytery, Chester Road.

**Manchester.**—Child welfare centre, Thornton Street (£4,125); G. Noel Hill, city architect, Town Hall, Albert Square, Manchester, 2.

Office at works, Hulme; W. Williamson, builder, 5, Hague Street.

H.v. substation and office at works; Banister, Walton & Co., Ltd., constructional engineers, Trafford Park.

**Middlesbrough.**—Work for the N.F.S.—Fire station, Southfield Road; N. Thompson, Ltd., builders, Middlesbrough. Appliance house, Queen Mary Street; W. A. King & Son, builders, Middlesbrough. Fire station, Commercial Street; J. C. Watson, builder, Stockton.

**Morley.**—Bus station; F. Turner, borough surveyor, Town Hall.

**Oldham.**—Pump house, at Institution; James Hartley, building contractor, Cobden Street, Chadderton.

**Rochford.**—Houses at Hockley and Canewdon, for R.D.C.; A. N. Box, surveyor, Council Offices, Rochford, Essex.

**Salford.**—Additional buildings at Hope Hospital (£2,000); W. Albert Walker, borough engineer, Town Hall, Bexley Square, Salford, 5.

Administrative offices, maternity and child welfare centre, school medical services, etc., Broad Street, Pendleton; city engineer.

**Salop.**—School canteen kitchen, Wem; A. G. Chant, county architect, 5, Belmont, Shrewsbury.

**South Shields.**—Boiler house extensions for Wrights Biscuits, Ltd.; R. Summerbell & Son, Rutland Street.

**Stafford.**—Additions to Girls' High School; A. C. H. Stillman, county education architect, County Buildings, Stafford.

**Stockport.**—Adaptation of "Heathfield," Cale Green, as extension to the Stepping Hill Hospital; W. F. Gardner, borough surveyor.

**Sunderland.**—Pump house at electricity works; W. A. Royle, borough electrical engineer.